DIVORCY

Pacific Seabird Group

BULLETIN

Volume 13 Number 1 1986

SHOUT
SHARE
IT

PACIFIC SEABIRD GROUP

BULLETIN

Volume 13 | 1986 | Number 1

The Chair's Page 3

Pacific Seabird Group News 5

Twelfth Annual Meeting 15

The Program Chair's Comments 15

Abstracts 16

Regional Reports 54

Southern California 54

Conservation Section 55

Committee on Seabirds and Fisheries 59

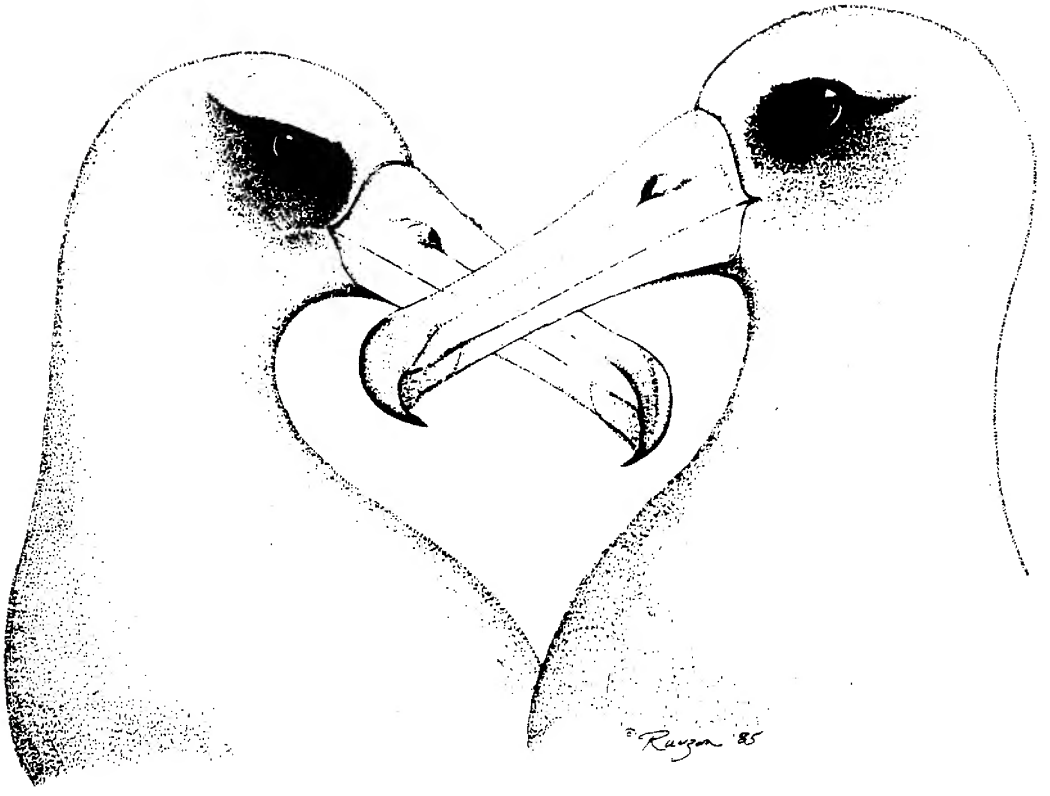
U.S. Fish and Wildlife Service Nongame Programs 60

Washington Report 63

New Publications 67

Bulletin Board 68

New Members 70


©Ruzga '85

THE CHAIR'S PAGE

What keeps a scientific society viable? 1) Active members who are eager to share ideas, 2) new members with fresh ideas, 3) communication between researchers, 4) a view to the future, and 5) enthusiasm.

It all comes back to you, the members. Contribute just a little more to your society than your money. Share your knowledge. Recruit a new member. Share your concerns on a conservation issue. Splurge: spend $0.22 and send me a letter with your ideas. PSG is YOUR voice. Keep it strong with your interest and enthusiasm.

Success was stamped on each of PSG's 1985 ventures. The first combined meeting with the Colonial Waterbird Groups was an unqualified success. The symposia chairs organized two exceptional sessions. The exchange of information between seabird and colonial waterbird biologists was rewarding. Thanks to everyone who attended and helped make that meeting a success.

Dan Anderson and Juan Guzmán have succeeded in achieving a PSG goal of reaching out to Latin American countries. The Executive Council has talked of a PSG meeting in La Paz for at least 10 years. The 1986 meeting promises to be one of our most invigorating meetings. You can look forward to meeting seabird ornithologists from all over the world, a great symposium, and some adventurous field trips. The La Paz meeting may be far from PSG's so-called "roots," but is will help spread the message of seabird conservation throughout Latin America.

The Executive Council is working to establish a "Travel Fund" for foreign ornithologists or students. This fund is especially important because we want to encourage the participation of Latin American ornithologists at the 1986 meeting. If you have any ideas on sources of funds for foreign travel or if you know of any Latin American researchers that should receive meeting announcements, please write or call Dan Anderson or me.

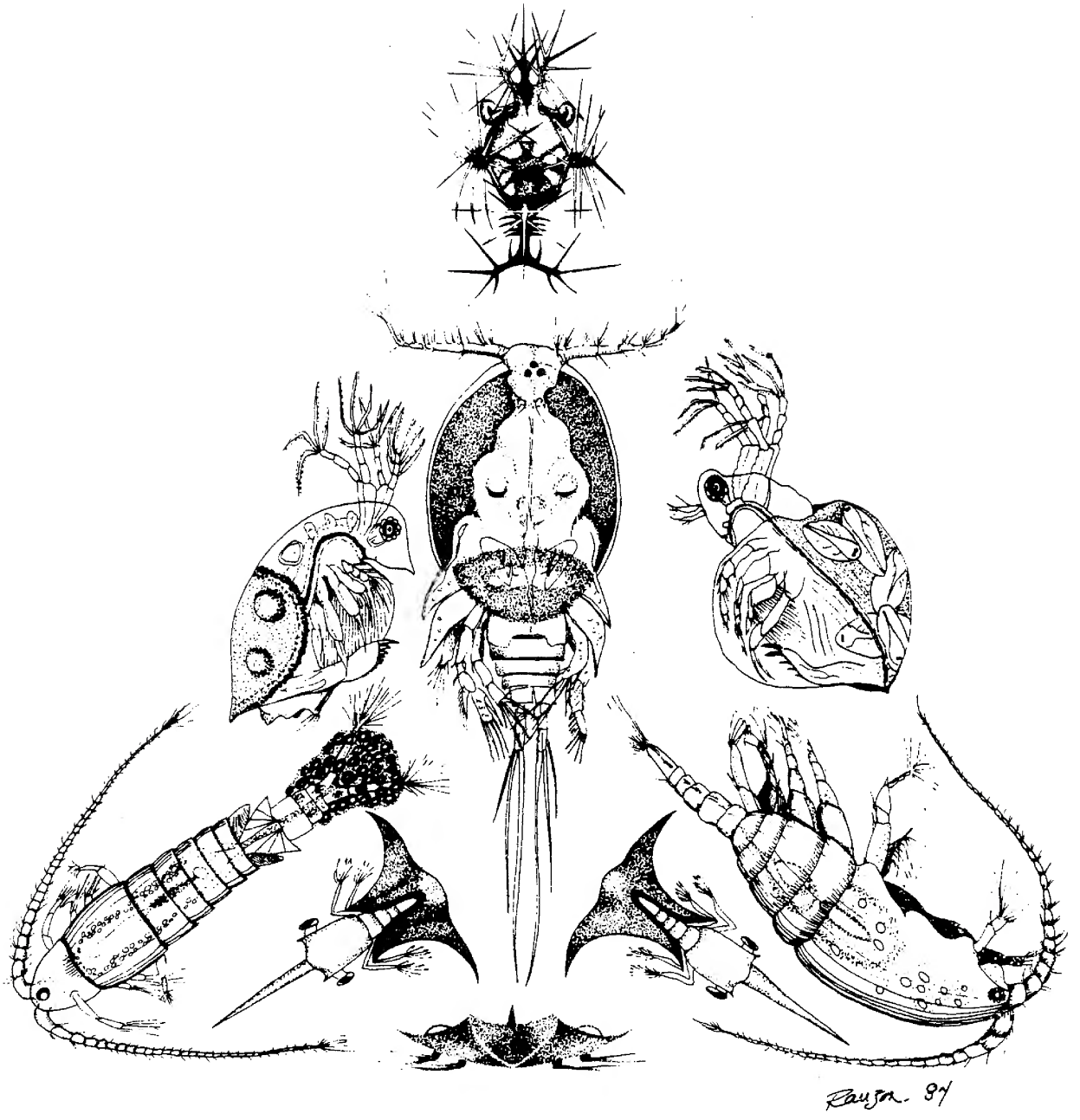
A few members have already helped PSG reach out to ornithologists from other countries by sponsoring a Bulletin subscription. If you wish to be a sponsor or suggest a candidate, please write to Doug Siegel-Causey, PSG Treasurer.

Another successful PSG venture is the Conservation Committee. Kees Vermeer volunteered to lead the Committee in 1982. A special "Thanks" to Kees for his organization of the conservation "network," his careful tending of conservation issues, and his concern that the Committee identify some long-range as well as short-term projects. Kees has passed the leadership of the Committee to Jay Nelson, USFWS Anchorage. Jay has played an active role in seabird conservation in Alaska. *He needs to hear about your concerns.*

A successful year of fund-raising for the Endowment Fund! Thanks to the efforts of Craig Harrison and Judith Hand, PSG members showed their support for the Fund by purchasing life memberships. Now, the Fund Raising Committee needs names of individuals or businesses that might be interested in a corporate sponsorship. Any ideas?

I feel as though I've just completed a section for the "want ads." "Wanted: PSG members who are willing to share in the responsibility for the success of their society."

Lora L. Leschner


Rauson 94

Proposed Minutes of the Pacific Seabird Group Executive Council Meeting, 4 December 1985

1. Quorum Present: Dan Anderson called the Executive Council Meeting to order at 2:00 p.m. at the Financial District Holiday Inn in San Francisco, California. Executive Council members present were Dan Anderson, Lora Leschner, Judith Hand, Doug Siegel-Causey, Malcolm Coulter, Ken Briggs, Ed Murphy, Enriqueta Velarde, Tony DeGange, and Stewart Fefer. Harry Carter held proxy for Tom Harvey; Eric Cummins held proxy for Steve Speich; and Dan Anderson held proxy for Craig Harrison.

2. DeGange summarized the minutes from the 11th Executive Council meeting held on 13 December 1984, and they were unanimously approved.

3. Election Results: Palmer Sekora, Election Committee Chair, reported on the election results. Ken Briggs was elected Chair-Elect; Doug Siegel-Causey was reelected Treasurer; and Tony DeGange was reelected Secretary. New Regional Representatives were: Mike Frye, Central California; Zoe Eppley, Southern California; Mark Tasker, New England, Maritime Canada, and Europe; Ron Naveen, eastern and southeastern U.S. and Africa; Hans Blokpoel, Great Lake states and provinces; and Paul James, inland states and provinces.

4. Treasurer's Report: Doug Siegel-Causey presented the Treasurer's report. Most of this report will be published in a forthcoming number of the Bulletin, so it will not be repeated here. Siegel-Causey reported that the Endowment Fund now stands at $5,000.00 and is placed in a tax-exempt, high-yield account which cannot be touched for four years. Siegel-Causey suggested that what funds are to be placed in the Endowment Fund need to be spelled out in writing, either in the Bylaws or in the Bulletin. Siegel-Causey also reported that he still needs a financial statement from last year's meeting.

   Membership: Siegel-Causey reported that currently there are 411 members, of which 66 are behind in dues by one year and 10 are behind by two years. Hand suggested that a letter be sent to those members in arrears for two years and then drop those who do not respond. Those in arrears for one year will be given another year to pay their dues, and they will also be dropped if they do not rejoin. Siegel-Causey reported that there was a loss of 3 members in the past year and a gain of 28. Most of the new members resulted from a mailing of the new PSG brochures. DeGange reported that more than 100 were mailed during late summer and fall, 1985. As far as special categories of membership are concerned, only three individuals have joined at a level above the basic $10.00 membership, and these were at $25.00. Siegel-Causey reported that the sponsorship program for individuals in foreign countries is off the ground. Four individuals are currently sponsored by PSG members, and four additional individuals are awaiting sponsors (their names were published in the last Bulletin (Vol. 12, No. 2). DeGange reported that a letter, written by Dan Anderson and himself and published in the Bulletin (soliciting names of prospective new members and candidates for sponsorship from the general membership) was unproductive. Siegel-Causey reported that the membership list has been broken down by regions, and these will be forwarded to regional representatives in the near future. This will facilitate the ability of regional representatives to contact members in their regions. Siegel-Causey MOVED that regional representatives be given the power to send mailings to members in their regions using funds in the PSG treasury, subject to approval by the Chair or the Treasurer. The motion was SECONDED and PASSED. Coulter reminded the Executive Council that any individual mailings of over 200 pieces can go by bulk mail through him.

Back issues of the PSG Bulletin are currently handled by the Schreibers at L.A. County Museum. In exchange for this service, the Schreibers receive and store journals that PSG receives in exchange for the Bulletin. Hand suggested that an appropriate item for the next Bulletin is a list of journals or publications that PSG receives in exchange for the Bulletin. It was generally agreed that these exchange publications continue to be handled by the Schreibers since the L.A. County Museum is our unofficial library. It was suggested that any items in these publications that the Schreibers feel would be of interest to the general membership be sent to Malcolm Coulter for inclusion in the Bulletin.

5. There was some discussion of whether or not the Point Reyes Bird Observatory was the most appropriate location for the permanent address of the Pacific Seabird Group. A considerable amount of mail addressed to PSG is handled through PRBO; at times, the forwarding of mail from PRBO to the Chair and then to the appropriate officer takes a long time. After a discussion, it was agreed that the present system was sufficient. Ed Murphy suggested that the transfer of mail from PRBO to the Chair could be facilitated if PSG paid the postage. Anderson reiterated that, in the future, the Secretary needs to provide PRBO with sufficient labels of the Chair's address so that mail can be promptly forwarded.

6. Editor's Report: Coulter informed the Council that the deadline for the next issue of the Bulletin is 15 January. Regarding the Spanish newsletter (which was suggested last year by David Duffy as a vehicle to reach seabird enthusiasts in Spanish speaking countries) Coulter reported that Duffy is currently seeking funds for the project. Anderson stated that the project seems to be taking a long time to get going and suggested that Coulter write to Duffy expressing our continued interest in the project. Hand suggested that PSG be patient since the project is a good idea and, at present, represents no cost in time or money to PSG. Anderson reported that the AOU Conservation Committee is putting out a list of individuals in Central and South America interested in bird conservation; this could be used to form a mailing list for the Spanish Newsletter. Enriqueta Velarde stated that the Mexican Ornithological Society has published a directory of members which could be used for a similar purpose.

   Coulter reported that some of the regional representatives are inactive. It was suggested that a statement be included in the duties of regional representatives that states that they must conform to the Editor's deadlines. Coulter stated that it would not be beneficial to him to have regional reports submitted on disks.

7. Standing Committee Reports: Fund-Raising and Endowment Committee—Hand reported that only one regional representative responded to the letter from Cheryl Bellrose asking them to list organizations or companies in their area that might contribute funds to PSG. The Committee decided to approach those companies identified by that regional representative and, if the response is positive, then proceed to solicit names from the other regional representatives again.

   Hand further reported that there has been no accounting of funds generated from sale of T-shirts and puffin mobiles although they have been identified as going into the Endowment Fund. Hand reported that the Committee decided that one likely way to generate money for the Endowment Fund is to push for life memberships (that effort at the annual meeting was very successful). Hand also stated that the dues card sent out to members needs to be reprinted to reflect new membership categories.

Seabird-Fisheries Interaction Committee-Alec McCall, the Chair of the Committee, stated in a phone call to Dan Anderson that the Committee is set up, and he would like to hear from people.

Translations Committee-Siegel-Causey reported that Portenko's Birds Of The Chukchi Peninsula And Wrangel Island, Vol. 1 is available. Vol. 2 has been translated and will be out in the fall, published by the National Technical Information Service (NTIS) in the U.S. Siegel-Causey said that he is making decisions on the common names of birds for the volume. Siegel-Causey also reported that the Department of Agriculture has money for translation of literature from foreign languages. The articles must be agriculturally related, but this might be interpreted loosely. This might be a useful way to get articles translated--provided you have no other financial support for doing so. The AOU committee currently has 70 titles being translated under the program, one-half of which are in Spanish. A notice of this translation program will be published in a future Bulletin.

8. Historian's Report: George Divoky stated that, in the future, he wants photographs taken of all Executive Councils. An effort will be made at this and all future annual meetings to take candid photographs of members. Hand suggested that Divoky obtain all programs of past meetings. Anderson stated that he had some files of historical material of PSG for the historian. It was suggested that this material be archived at the L.A. County Museum, and a filing cabinet be purchased for storing this material.

   In an unrelated matter, Divoky stated that changes of policy towards seabirds are developing within the U.S. Fish and Wildlife Service and other government agencies with the ultimate intent of lessening the importance of seabirds in federal research and management efforts. Anderson reported that state agencies are under similar pressure to lessen effort on seabirds. An informal meeting to discuss this topic was scheduled for later during the annual meeting.

9. ICBP Representative's Report: Ralph Schreiber through Dan Anderson stated that the working group of the ICBP on seabirds is looking for input on what it should be doing. They are also doing a handbook on seabirds of the world and are looking for authors to do revisions of the status of seabirds for several geographic areas, including western U.S., Argentina, and the Caribbean, to be included in a revision of the ICBP book on seabirds published in 1984.

10. Reports of Regional Representatives: Stewart Fefer reported that the master plan for the Hawaiian Islands National Wildlife Refuge should be out soon, and most of PSG's comments were incorporated into the plan. Steve Thompson reported that the Protection Island Master Plan is also available, but the funding to carry out the plan is not.

    Jeff Froke commented on the offshore oil leasing process off Orange County, California. Froke stated that risks to wildlife and the environment were of little importance in stopping lease sales there. What was important were property values, and the political pressure put on the Department of Interior by wealthy landowners.

    Enriqueta Velarde reported that the Fisheries Bureau of Mexico is interested in making Los Angeles Bay in Baja California a preserve. Los Angeles Bay is a critical nursery area for juvenile sardines. Velarde said that the Fishery Bureau of Mexico needs support from individuals and organizations in the form of letters. Dan Anderson said the preserve is a unique concept in marine preserves. For birds, the area is very important for non-breeders.

Anderson stated that the fishery is progressively taking smaller classes of sardines, most of which are turned into fishmeal. The fishery is viewed as a short-term one. Anderson MOVED that the Pacific Seabird Group draft a letter to the Fisheries Bureau in support of creating a preserve in Los Angeles Bay, Baja California, as a nursery ground for sardines and a preserve for other marine wildlife. The motion was SECONDED and PASSED unanimously. A request for letters from the membership will be put in the Bulletin.

Steve Speich, in a letter to Dan Anderson, stated that every other year the annual meeting should be in Asilomar. In alternate years, the meeting could rotate among sites on the Pacific coast but not in major urban areas where costs are high.

11. New Business: Future Meetings—Our next annual meeting will be held in La Paz, Mexico, which is in Baja California. Speich's letter prompted some discussion on meeting sites. Leschner agreed that Asilomar is inexpensive, but no local committee is available there to help out. She suggested that PSG not go there so frequently. Steve Thompson supported what Speich said about costs of meetings, stating that costs are a burden for those who don't get their way paid. He agreed that holding meetings outside of major urban areas to hold costs down would be appropriate. Although Asilomar presents some problems, it was agreed that we would try to hold our annual meeting there in late 1987 or early 1988. Ken Briggs was appointed to approach someone who would be willing to act as chair of a local committee for that meeting.

George Divoky raised the possibility of having officers serve terms of two years rather than one. After some discussion on the matter, it was decided that the present system of one-year terms is working fine and should not be tampered with.

Judith Hand stated that she would like to see the PSG Bulletin accept advertising and that revenues generated from advertising be put in the Endowment Fund. Froke suggested that a possible requirement for advertisers might be that they join PSG. After a lively discussion, Hand MOVED that we accept advertisements in the PSG Bulletin that are in harmony with the spirit of the Bulletin (which is to be decided by the Editor); that the Fund-Raising Committee look into the costs of advertising; and that proceeds from advertisements be put into the Endowment Fund. The motion was SECONDED and PASSED.

Doug Siegel-Causey raised the question of whether or not PSG should sell its mailing list. He stated that the Executive Council had agreed a few years ago to do so, but some questions remained. After some discussion, it was agreed that the mailing list could be sold for one-time use only.

Local Chair Report—Bob Boekelheide reported that the local committee experienced few problems in getting the meeting organized. As of the Executive Council Meeting, 159 people had registered for the meeting, and 90 people had registered for the banquet. The field trip to the Farallon Islands was sold out. Some discussion ensued about the format of future meetings. Divoky suggested that some sessions should be of longer length to encourage questions following the papers. It was also suggested that, at meetings where there are to be many papers, we go to joint sessions or encourage more posters rather than reduce the duration of lecture presentations. Anderson MOVED that PSG thank Bob Boekelheide, members of the local committee, volunteers from the Point Reyes Bird Observatory, the San Francisco Bay Bird Observatory, the San Francisco Bay National Wildlife Refuge, and

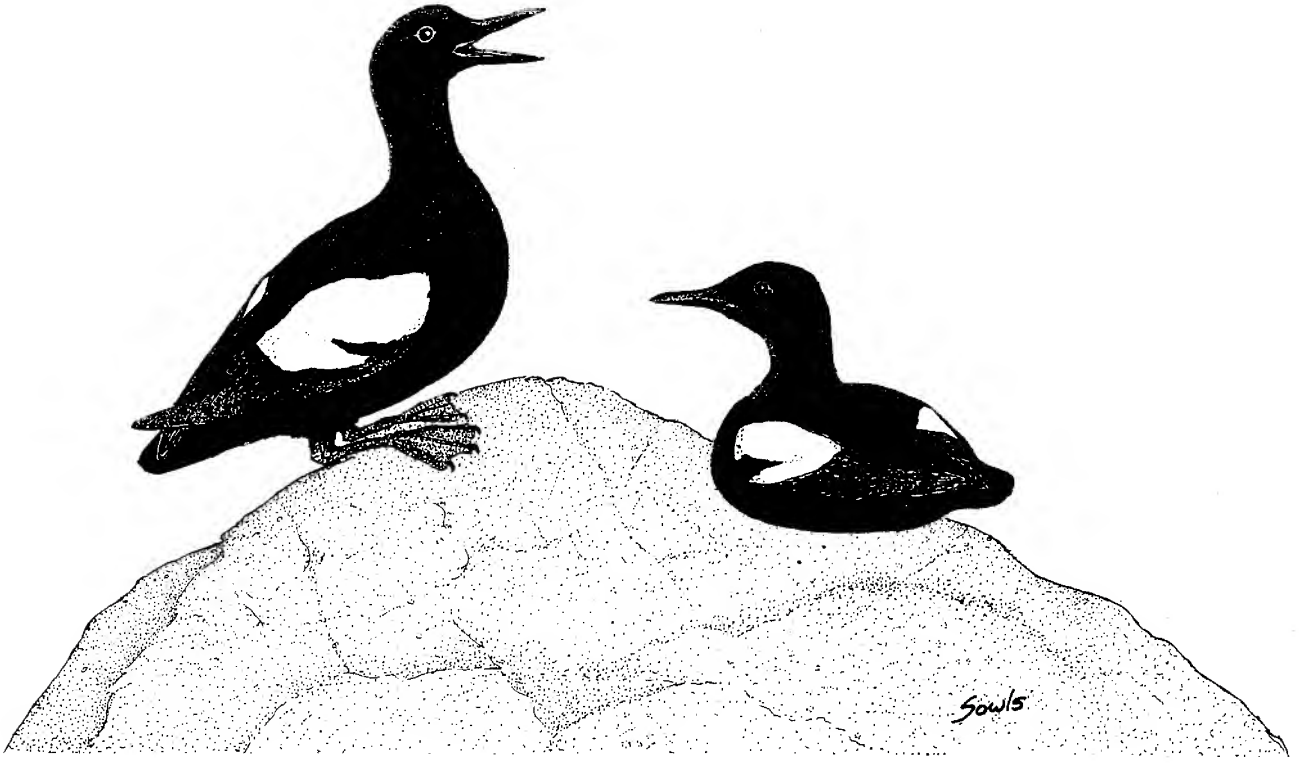
program chairs (Lora Leschner [PSG] and Bill Southern [CWG]) for their hard work in putting together the meeting. The motion was SECONDED and PASSED.

Report of the Local Committee for the La Paz meeting—Juan Guzmán, Local Committee Chair, reported that early or mid-December would be the best time for the La Paz meeting from the perspective of the hosts. After a lengthy discussion, it was agreed to held the meeting from 10-14 December. Guzmán said that two auditoriums, a gymnasium, and a meeting room would be available for our use. Guzmán emphasized the low costs of food and housing in Mexico and several different options for exciting field trips. Future announcements on the meeting (including room and board rates, field trips, and transportation options) will be published in the Bulletin.

Future Symposia—George Divoky reported that NOAA is willing to fund a symposium to encourage presentation of information on using seabirds to monitor changes in the environment from man-made or natural perturbations. George will look into rounding up council members to set goals for such a symposium. For the La Paz meeting, Dan Anderson suggested a symposium that will pull together information on the marine birds of the Gulf of California and the west coast of Baja California. Harry Carter suggested a symposium be designed for the La Paz meeting that would encourage participation by South American researchers. Spencer Sealy, in a letter to Anderson, reported that the alcid symposium planned for the 1988 meeting was on schedule. Fifteen contributions on the biology of alcids at sea have been proposed.

DeGange MOVED that the Executive Council thank Dan Anderson for his work the past year as Chair. The motion was SECONDED and PASSED.

Anderson MOVED to adjourn at 6:30 p.m. The motion was SECONDED and PASSED.



Proposed Minutes of the Pacific Seabird Group Executive Council Meeting, 7 December 1985

1. Quorum Present. Incoming Chair Lora Leschner called the meeting to order at 7:00 p.m.

2. Sekora, Chair of the Election Committee, reported that he had two nominations for Chair-Elect, one nomination for Treasurer, and one nomincation for Secretary thus far for the upcoming election. It was suggested that Sekora draw up a map depicting the new regions for the regional representative system.

3. Leschner reported that Enriqueta Velarde will draft a letter for PSG regarding the proposed preserve in Los Angeles Bay. George Divoky will be responsible for drafting a letter for PSG regarding the Fish and Wildlife Service's reductions in non-game programs. Anderson will draft a letter for PSG regarding the proposed de-listing of the Brown Pelican in California from endangered to threatened. The latter letter will be sent to Executive Council members and then to the Bulletin.

4. It was suggested that PSG financially support some researchers from Central and South America who might otherwise not be able to attend the La Paz meeting. Judith Hand reminded the Executive Council that funds for such activities could not come out of the general fund. If members of PSG wish to support their colleagues in this fashion, then other sources of funds must be found. Anderson suggested that PSG set up a Travel Assistance Fund or provide a Travel Scholarship to meetings. Suggestions of sources of such funds included the National Science Foundation, the World Wildlife Fund, U.S. AID, and the Tinker Foundation. Malcolm Coulder was appointed to make a list of names of organizations from which travel funds could be solicited.

5. Kees Vermeer informed the Executive Council that he wishes to step down as Chair of the Conservation Committee. Lora Leschner will review the functions of the Chair of this Committee. Vermeer emphasized that the accomplishments of this Committee very much depends upon the grass-roots efforts of members and regional representatives. Leschner will seek another individual who is willing to chair the Committee.

6. The following were suggested by members of the Executive Council as goals for the following year:

Malcolm Coulter	-	Expand the Bulletin and encourage more representation from Asia and Central America.
Judith Hand	-	More support for sponsorship program.
Enriqueta Velarde	-	Support for establishing a computerized data base on marine birds for Mexico, including the Gulf of California and the west coast of Baja California.
George Divoky	-	Change format of paper presentations at the annual meeting to encourage time for more questions and interactions during sessions.
Juan Guzmán	-	Encourage more poster presentations at annual meetings.
Tony DeGange	-	Encourage more grass-roots support for local conservation issues.

Meeting was adjourned at 8:10 p.m.

Respectfully submitted,
Anthony R. De Gange, Secretary

TREASURER'S REPORT--1985

Membership

The membership of PSG was increased last year by 45 new members, 32 of whom used the new brochures. These members learned about the activities of the Pacific Seabird Group by reading the information sent to them by other members. Our current standing in membership is as follows:

Membership as of 1 Jan 1985		391
Dropped or lapsed	(−)	26
New members	(+)	45
Membership as of 31 Dec 1985		410
Net increase	(+)	19

1985 Income and Expenses

Our income in 1985 is about normal for PSG: the sale of back issues and memberships are the mainstay of our operating expenses. Life memberships put us far along the way towards our goal, but the money from them should not be considered part of our income yet since it is transferred into our Endowment Fund. Charlie Collins' careful stewardship of the Long Beach Annual Meeting allowed a substantial profit, which allows us greater latitude in printing the Bulletin.

Expenses are primarily related to publishing the Bulletin and, as has been the case in recent years, seem to constantly increase. Postage and printing assume about 70% of the budget expenses, the rest are expenses related to maintaining PSG as an entity. As of 31 December, $5,000.00 was deposited into the Endowment Fund; the remainder of the funds were deposited in early 1986.

Endowment

To this date, PSG has deposited $8,200 into our Endowment Fund which is wholly invested in the Dean Witter U.S. Government Securities Trust. The current annual return is over 12%. The sources of the principal are as follows:

Initial deposit	$5,000.00
22 Life Members 1st installment at $75.00	1,650.00
4 Life Members paid in full	1,200.00
Profits from T-shirt sales	350.00
Total Invested	$8,200.00

Treasurer's Report--1985

CARRYOVER FROM 1984 (Checking: $1,095.01; Savings: $5,722.03)		$ 6,817.04
INCOME		
Dues and Sales of back issues	$4,561.55	
Income from Long Beach Annual Meeting	1,634.88	
Life Memberships (to be transferred to Endowment Fund)	2,025.00	
Interest on Commercial Accounts	181.40	
		6,453.18
EXPENSES		
Bulletin costs	1,967.88	
Officer's expenses	182.00	
General office expenses (filing fees, etc.)	18.50	
ICBP Dues	100.00	
San Francisco Annual Meeting expenses	382.16	
Membership brochures	1,077.50	
Transfer to Endowment Fund	5,000.00	
Service charges, bad checks, etc.	38.65	
		(8,766.69)
ENDOWMENT ACCOUNT		
Initial deposit	5,000.00	
Interest from 3 April to 31 December)	468.03	
		5,468.03
END OF YEAR BALANCES (Checking: $951.36; Savings: $2,593.10; Endowment: $5,468.03)		$ 11,921.21
Net increase in worth over 1984		$ 2,908.72

Douglas Siegel-Causey

COMMITTEE FOR FUND RAISING FOR THE SYMPOSIUM ENDOWMENT FUND

Symposium Endowment Fund

The purpose of the fund is to enable PSG to organize and publish quality symposia dealing with conservation or study of seabirds. Toward this end, all capital raised for the fund is to be invested. When the fund reaches a size sufficient to provide the necessary income, interest from these investments will be used to fund symposia. The ultimate goal is a fund of approximately $100,000.00. The immediate goal of your FRC (Fund Raising Committee: C. Bellrose, M. Coulter, J. Hand, C. Harrison, L. Leschner) is to get the fund up to $50,000.00, a sum which should double itself in about seven years. That seems a long way to go, but we also seem to be making good, steady progress. The following items should give you an idea of where we stand at the moment and plans for the future:

1. The fund currently has approximately $8,000.00. It is invested in a four-year Government Securities Trust, which last year earned approximately 14%.

2. Last year, our sources of capital for the Fund came from a) interest on capital already invested, b) sale of PSG T-shirts, c) funds donated by Art Sowls which were a percentage of his sales of puffin mobiles at the meeting in Long Beach, and d) 28 life memberships taken out by PSG supporters at the meeting in San Francisco and through the mailing of brochures to potential new members by Secretary Tony DeGange. The following took ouf life memberships:

David G. Ainley	Daniel W. Anderson
Robert Boekelheide	Kenneth T. Briggs
Joanna Burger	Roger B. Clapp
Cheryl Conel	Malcolm C. Coulter
Tony DeGange	Jan Dierks
George J. Divoky	Stewart Fefer
Douglas J. Forsell	Michael Fry
Judith Latta Hand	Craig Harrison
Scott A Hatch	David B. Irons
Lora Leschner	David B. Lewis
Ed Murphy	Palmer Sekora
Douglas Siegel-Causey	Arthur L. Sowls
Jeffrey Spendelow	Breck Tyler
Enriqueta Velarde	Kees Vermeer

3. This next year, the members of the FRC have agreed to a) approach corporations which we feel might be willing to establish a corporate sponsorship of PSG (minimum $1,000.00). If we devise a successful approach, we hope that other PSG members will be willing to make similar contacts to companies in their towns or regions, b) arrange for a fund-raising activity at the meeting to be held in La Paz (we welcome any suggestions from anyone on ideas for fund raising; contact any FRC member).

As governmental funding for travel and publication costs becomes ever tighter (to say nothing of funds for research), it becomes even more important that PSG has its own, independent source of funding. We are looking to and planning for the future, and the FRC encourages any member interested in this project to *get in touch*. We'll put you on the Committee!

Judith L. Hand

PSG Committees

The PSG Committees deal with issues that are important to all of us. Members are encouraged to join committees or to contact the committees concerning topics that are pertinent. This will keep us from missing issues with which we should be involved. PSG has five committees. If you are interested, please contact them:

1. Conservation Committee - Jay W. Nelson, U.S. Fish and Wildlife Service, Wildlife Assistance, 1011 Tudor Road, Anchorage, AK 99503

2. Fund Raising Committee - Judith L. Hand, 1647 Michael Lane, Pacific Palisades, CA 90272

3. Seabirds-Fisheries Interaction Committee - Alec D. MacCall, Southwest Fisheries Center, National Marine Fisheries Service, NOAA, 8604 La Jolla Shores Drive, P. O. Box 271, La Jolla, CA 92038

4. Translation Committee - Douglas Siegel-Causey, Museum of Natural History, University of Kansas, Lawrence, KS 66045

5. Student and Foreign Travel Fund Committee - We are looking for someone to chair this committee. It will be responsible for raising funds so that foreigners and students can attend the annual meetings.

1986 Annual Meeting

The 1986 annual meeting of the Pacific Seabird Group will be held 10-14 December 1986 in La Paz, Baja California Sur, Mexico. The meeting will feature a symposium on the biology of seabirds of the Gulf of California, organized by Dan Anderson (Department of Fisheries and Wildlife Biology, University of California, Davis, CA 95616) and Enriqueta Velarde (Instituto de Biologia, Departamento de Zoologia, Apartado Postal 70-153, 04510 Mexico D.F., Mexico). Field trips are planned to islands of Bahia de La Paz and, perhaps, also to the desert and coast near Cabo San Lucas. The meeting is being held at the invitation of the Universidad Autonoma De Baja California Sur which will provide meeting space, local accommodations for students, and the annual banquet. A variety of air carriers, ferries, and bus routes serve La Paz; a bus/camping tour of Baja California is on the drawing board. A detailed announcement and call for papers will be mailed in July. To allow for difficulties in international communications and translation of the program to Spanish, a firm deadline of September 15 will be established for abstracts. Please begin to plan that talk or poster presentation soon. The La Paz Local Committee is chaired by Juan Guzman (Departamento de Biologia Marina, UABCS, Apartado Postal 214, La Paz, BCS, Mexico) and the Program Chairman is Kenneth Briggs (Institute of Marine Sciences, University of California, Santa Cruz 95064). "Be there!"

THE PROGRAM CHAIR'S COMMENTS
TWELFTH ANNUAL MEETING
FIRST COMBINED MEETING WITH THE COLONIAL WATERBIRD GROUP

San Francisco, California
4-8 December 1985
Lora L. Leschner

The Pacific Seabird Group and the Colonial Waterbird Group hosted two outstanding symposia. Once again, we have provided an opportunity for researchers to discuss the latest developments in their fields. We were fortunate in having so many papers contributed by European and South American authors. PSG is a leader in bringing scientists together in symposia that aid wildlife managers and researchers in the conservation of marine birds and their habitat.

The general papers and poster sessions were an overwhelming success. The San Francisco meeting poster session was the largest ever hosted by PSG. Posters provided an opportunity for discussion as well as a more thorough presentation of completed projects. I can see that poster sessions may become an excellent forum for "feedback" to authors with preliminary data or ideas. The presentation of untested hypothesis, status summaries, technique reports, and preliminary data has always been an important part of our scientific paper session.

Art Sowls gets an award for his Hollywood intrique version of PSG. A subcategory to this award goes to Tony DeGange for being pictured the most frequently with the greatest number of Hollywood beauties. You would think that Tony could persuade some of his rich and famous friends to contribute to the Endowment Fund!

Bob Boekelheide bravely volunteered to provide the banquet entertainment. He presented a humorous historical "Travels with PSG Greats" that had us all cackling with memories of our own experiences.

The participants, session chairs, and the local committee on arrangements all deserve special thanks. The symposium chairs (Mike Erwin, Howard Cogswell, Malcolm Coulter, Judith Hand, William Southern, and Kees Vermeer) invited excellent speakers and organized very thoughtful sessions. Our general session chairs in order of appearance were Lora Leschner, Palmer Sekora, Don McCrimmon, Ken Briggs, and Dan Anderson. The local committee (led by Bob Boekelheide and Don McCrimmon and staffed by volunteers from Point Reyes Bird Observatory, San Francisco Bay Bird Observatory, and San Francisco Bay National Wildlife Refuge) all helped to keep things running smoothly.

It was a great meeting. See you in sunny La Paz!

ABSTRACTS

RELATIONSHIP BETWEEN DIET AND REPRODUCTIVE SUCCESS IN PIGEON GUILLEMOTS ON THE FARALLON ISLANDS

Ainley, David G. (Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach CA 94970)

The menu of prey fed to chicks, the number of chicks fledged per pair, and fledging weights were determined for a 13-year period, 1971 to 1983. During years when pelagic, schooling fish dominated the chick diet, guillemots produced more than one chick (on average) per breeding pair. Fledglings were heavy as well. Otherwise, reproductive success and chick weights were low, and more similar to values determined in other guillemot studies. The degree to which the ecology of guillemots on the Farallones is typical for the species and genus will be discussed.

DISTRIBUTION AND NESTING OF OSPREY (*PANDION HALIAETUS*) IN BAJA CALIFORNIA SUR, MEXICO

Amador, E. (Centro de Investigaciones Biológicas de Baja California Sur A.C. Apdo. Postal #128, La Paz, B.C.S. 23000 México) and J. Guzman (Universidad Autónoma de Baja California Sur, Depto. de Biología Marina. Apdo. Postal #129, La Paz, B.C.S. 23000 México)

Most studies of Osprey in Baja California have been done in the north and central parts of the peninsula. Here, we report on the distribution, abundance, and some aspects of reproduction of Ospreys in two southern localities. One area studied is Santa Margarita Island (Lat. 24° 30' N, Long. 111° 50' W) on the Pacific side, where coastal censuses around the Island have been carried out since 1980. The other area is the Bay of La Paz (Lat. 24° 30' N, Long. 110° 35' W) in the Gulf of California, which has been surveyed since 1983. Information on food habits will also be discussed.

KLEPTOPARASITISM IN THE AMERICAN WHITE PELICAN

Anderson, John G. T. (Dept. of Zoology, Univ. of Rhode Island, Kingston, RI 02881)

Observations of American White Pelicans (*Pelecanus erythrorhyncus*) at Pyramid Lake in Western Nevada revealed that, during the early portion of the breeding season, the birds obtain a sizable portion of their food by stealing it from Double Crested Cormorants (*Phalacrocorax auritus*). Incidence of kleptoparasitism appeared to be correlated with the concentration of prey species in deeper water. Since cormorants dive when feeding (while pelicans are limited to the upper meter of the water column) they are better suited to obtaining fish during this period. Groups of pelicans tended to converge on foraging flocks of cormorants and to pounce on individual birds as they surfaced. The pelicans struck at and sat upon their victims until any prey items were released. A general free-for-all then ensued as neighboring birds joined in attempts to secure the fish. The frequency of kleptoparasitism declined markedly during summer months as prey fish moved into shallow water to spawn.

SWITCHING IN GULL DIETS: RISK SENSITIVITY IN ADULT VS. CHICK TACTICS

Annett, Cynthia (Dept. of Zoology and MVZ, Univ. Calif., Berkeley, CA 94720)

Many studies of foraging tactics and diets in gulls have noted changes in diet over time. These switches are generally attributed to changes in abundance of different food types. I describe a rapid switch in the diet of two species, *Larus argentatus* and *L. occidentalis*, which does not appear to be related to food abundance, but rather appears to be driven by offspring demands for quality food. Adult gulls tend to forage in a "risk-averse" manner during pre-laying and incubation, exploiting only predictable sources of food, e.g., intertidal zones, garbage dumps. After chicks hatch, adults switch to "risk-prone" tactics, seeking high quality, but unpredictably distributed food sources, e.g., pelagic schooling fish. This switch appears to be driven by the chick's refusal of, or inability to handle, large, low quality food items, e.g., chicken parts, mussels, small seabirds. The chicks are able to handle and swallow the small fish (capelin, anchovy) brought to them by their parents after the switch. Experiments demonstrate that this switch can be manipulated by giving adults eggs or chicks outside of their natural schedule of reproduction. This suggests that, despite their inability to obtain their own food, chicks can have foraging tactics.

MAN-MADE POLDERS IN THE NETHERLANDS; A TRADITIONAL HABITAT FOR SHORE BIRDS.

Beintema, Albert J. (Research Institute for Nature management, postbus 46, 3956 ZR Leersum, Netherlands)

The typical old-fashioned Dutch grassland polder is a flat, open space, cut into squares by a maze of ditches and canals, and with a high water table, sometimes even with winter inundations (hence: no trees or buildings; these are found at the edges). Due to a rare combination of soil, climate, hydrology, and management, these moist but fertile artificial prairie holds high densities (up to over 100 pairs/sqkm) of six species of shorebirds, known as "meadow birds." This situation is now changing with improved drainage, increased fertilization, earlier mowing, and increased cattle densities. Meadow-bird reserves can easily be created by imitating old-fashioned farming, and by keeping high water tables, with dams and sluices. Other forms of meadow-bird management include financial compensation for private farmers for, e.g., late mowing. Technically, we know how our meadow-bird populations can be preserved and managed; keeping them is mostly a political and financial problem. In spite of some examples of very successful reserves, the total Dutch meadow-bird populations are steadily declining.

AVIAN UTILIZATION OF WETLANDS IN THE VICINITY OF MARCO ISLAND, FLORIDA

Below, Theodore H. (National Audubon Society, Rookery Bay Sanctuary, 3697 North Road, Naples, FL 33942) and M. Philip Kahl (P. O. Box 2263, Sedona, AZ 86336)

McIlvane Marsh, a 907 hectare impounded transitional wetland in Southwest Florida was studied intensely in the late nineteen seventies by a number of governmental agencies, as part of the development permitting process for a residential community. As a portion of this effort, the authors in 1979 recorded the foraging of "waders" (herons and ibis) in the marsh and 11,870 hectares of surrounding wetlands, with the purpose of assessing bird use of the area. We found that, over a five-month period, 50% of the waders used McIlvane Marsh, 8% of the total 12,777-hectare study area. This indicated that the marsh is of extreme value to the area and was one of the factors that influenced the developer to move the development to higher land.

NUMBERS OF WHITE IBISES BREEDING AND FEEDING IN THE NORTH INLET ESTUARY, SC: A CAUTIONARY TALE

Bildstein, Keith L., Jim W. Johnston (Department of Biology, Winthrop College, Rock Hill, SC 29733 and Baruch Institute, University of South Carolina, Columbia, SC), and Peter Frederick (University of North Carolina, Chapel Hill, NC 27514)

During each of four breeding seasons, 1982-85, we recorded the peak number of nests, the total number of nest starts, nest mortality, and the number of nests producing young on Pumpkinseed Island, site of a large breeding colony of White Ibises (*Eudocimus albus*) in Winyah Bay, directly south of the North Inlet Estuary. During the same time, we censused the number of adult and juvenile ibises feeding nearby on a portion of the estuary. In 1984 and 1985, we also counted the number of ibises flying north of the marsh to and from more distant freshwater feeding sites. The number of ibises nesting on Pumpkinseed Island fluctuated greatly from year to year, reaching a high of about 13,000 in 1984 and a low of about 2,000 in 1985. The number of birds flying over the marsh to feed on inland sites paralleled these fluctuations in 1984-85. The number of ibises feeding on the marsh varied little during the same period, reaching a high of 1.12 birds/ha in 1985 and a low of 0.78 birds/ha in 1983. The percentage of ibises feeding on the marsh that were juveniles declined steadily during the four years. The results indicate that breeding ibises do not feed on the nearby marsh in direct proportion to their numbers.

COMPARISON OF 1980 AND 1984 INVENTORIES OF COMMON TERN, CASPIAN TERN AND DOUBLE-CRESTED CORMORANT COLONIES IN THE EASTERN NORTH CHANNEL, LAKE HURON, ONTARIO

Blokpoel, Hans (Canadian Wildlife Service, 1725 Woodward Drive, Ottawa, Ontario, Canada K1A 0E7) and Anne Harfenist (243 Patricia Avenue, Ottawa, Ontario, Canada K1Y 0C6)

All active nests of Common Terns (*Sterna hirundo*), Caspian Terns (*Sterna caspia*), and Double-crested Cormorants (*Phalacrocorax auritus*) in the eastern half of the North Channel were counted in 1980 and 1984. Between 1980 and 1984, the following changes in nest numbers occurred: Common Terns decreased from 1,322 nests (at 19 colonies) to 1,293 nests (at 34 colonies), Caspian Terns increased from 547 nests (2 colonies) to 650 nests (2 colonies), and Double-crested Cormorants increased from 81 nests (2 colonies) to 569 nests (7 colonies). These changes in nest numbers are discussed and compared with trends on the rest of the Great Lakes.

SEABIRD REPRODUCTIVE FAILURE IN THE SOUTH ATLANTIC

Boersma, P. Dee (Institute for Environ. Studies, University of Washington, Seattle, WA 98195)

During El Niño Southern Oscillations (ENSO's), the warming of otherwise cool, nutrient-rich upwelling waters along the west coast of South America can cause massive mortality of seabirds and their young. Biological responses to ENSO's have been documented in the eastern and central regions of the Pacific Ocean and, during the 1982-83 ENSO, as far north as Alaska. This paper reports evidence that ENSO events impact the Atlantic Ocean as well.

The breeding patterns of seabirds nesting at Punta Tombo, Argentina, have been extremely variable between 1982-83 and 1984-85. For example, in 1982-83 a number of Magellanic Penguin pairs were able to raise two chicks. In 1983-84 they fledged, on average, less than one of the two chicks they hatched; and in 1984-85 penguins suffered a massive reproductive failure. Mean

surface water temperatures were unusually high, ranging from 17-19 C (normal = 14-16 C); this suggests reduced upwelling may have occurred. A significant change in penguin diet, from small fish in 1983 to squid in 1985, was noted and probably reflects changes in prey species abundances caused by anomalous oceanic conditions.

RELATIONSHIP OF DIET COMPOSITION WITH TISSUE MERCURY LEVELS AND THE ROLE OF FEATHER MOULT AS AN ELIMINATION ROUTE FOR MERCURY IN MARINE BIRDS

Braune, Brigit M., and David E. Gaskin (Dept. of Zoology, Univ. of Guelph, Guelph, Ontario, Canada N1G 2W1)

During 1978-84, cormorants, ducks, phalaropes, gulls, kittiwakes, terns, and guillemots were collected from the Quoddy region, New Brunswick, Canada. Muscle, liver, kidney, brain, and individual primary feathers were analyzed for total mercury. Birds whose diets were composed mainly of fish and/or benthic invertebrates contained the highest tissue mercury concentrations suggesting that degree of association with bottom sediments as well as trophic level of prey affects mercury accumulation via the food chain. It was shown that the mercury content in primary feathers, as an indication of tissue levels of mercury, was strongly influenced by the pattern of moult.

STATUS OF LARIDAE AND STERNIDAE BREEDING IN THE "VALLI DI COMACCHIO" (ITALY)

Brichetti, Pierandrea (Museo Storia Naturale, Via Ozanam 4, Brescia, 25100, Italy) and Ugo F. Foschi (Museo Ornitologico, Via Pedriali 12, Forli, 47100, Italy)

The "Valli di Comacchio" wetlands (Po Delta) are the principal Italian breeding zone for Laridae and Sternidae. Eight of the eleven species present in Italy nest there for a total of 2,804 pairs (1985 census). *Larus cachinnans*, *Sterna hirundo*, and *Sterna albifrons* have historically been present; *Larus ridibundus* and *Gelochelidon nilotica* began breeding in the 1950's. Three other species are recent colonizers: *Larus melanocephalus* (1978 with ca. 25 pairs), *Larus genei* (1978 with 2 pairs), and *Sterna sandvicensis* (1979 with 7 pairs). Further, in 1978, *Sterna caspia* bred (1/2 pairs) and then, in 1985, for the first time in Italy and the second time in Europe, *Sterna bengalensis* (1 pair). Current population (1985) is: Lm 103 pairs increasing; Lr 322 increasing; Lg 4 fluctuating; Lc 260 increasing; Gn 102 fluctuating; Ss 140 increasing; Sh 1,173 increasing; Sa 700 fluctuating. In Italy, Ss breeds exclusively in the Valli di Comacchio, Lg breeds in one other area (Sardinia), and Gn in two others (Sardinia, Puglia). The Sa population in the Valli di Comacchio is 15-20% of the Italian total (which is roughly 40% of the European total).

SCALES OF PATCHINESS IN SEABIRDS OFF CENTRAL CALIFORNIA

Briggs, Kenneth T. (Institute of Marine Sciences, Univ. of California, Santa Cruz, CA, 95064)

Variability in physical and biological processes in the ocean is scale-dependent. Intensity of aggregation is also known to be dependent on scale in various planktonic organisms and, for the Benguela Current, in several species of seabirds. Additionally, in anisotropic physical regimes (ones where variation depends on direction), biological patchiness differs in cross-shelf and along-shelf directions. Using survey data from 1980 to 1982, I determined the scales and directions at

which aggregation was most intense for five species of seabirds off California. At most, length-scale variation was most intense in the cross-shelf direction. Common Murres and Cassin's Auklets aggregated much more strongly than did other species, with peak intensity at scales of 24 km and 12 km, respectively. Seasonal and geographic differences prevailed: breeding species showed strongest aggregation near colonies and in summer and autumn. Temperature and chlorophyll data from satellites shows similar, rich variation at scales less than 25 km, particularly during upwelling.

EFFECTS OF OPEN MARSH WATER MANAGEMENT ON HABITAT USE BY BIRDS IN TWO MASSACHUSETTS SALT MARSHES

Brush, Timothy (Manomet Bird Observatory, Box 936, Manomet, MA, 02345), Richard A. Lent (Seatuck Research Program, Box 31, Islip, NY, 11751), and Brian A. Harrington (Manomet Bird Observatory, Box 936, Manomet, MA, 02345)

Modified open marsh water management (OMWM) was used to control mosquitoes on two salt marsh plots in northeastern Massachusetts. Treatment involved the creation of deep fish reservoirs by plugging and deepening old ditches on a formerly ditched, well-drained plot and on a poorly ditched, relatively natural marsh. Shorebirds, which foraged mainly in shallow pools or at pool edges, increased on the well-ditched marsh and remained abundant on the natural marsh. Herons, which were more restricted to pools, did not increase following OMWM. The OMWM method we employed does not create pools suitable for foraging herons, although pools may become reestablished over several years. In contrast, shorebirds were able to use both temporary spoil piles (one year following manipulation) and developing shallow pools and mudflats thereafter. Wider pools with both shallow and deep areas may be more immediately suitable for larger wader birds.

FORAGING EFFICIENCY IN GULLS: EFFECTS OF SPECIES, AGE AND HABITAT

Burger, Joanna (Biological Sciences, Rutgers University, Piscataway, NJ 08854)

I studied feeding efficiency in 13 species of gulls in North America, Africa, and Europe in different feeding situations and habitats to test the hypothesis that foraging efficiency increases with age, and the disparity between young and adults is greater in species with the most delayed maturity. Efficiency was measured by timing the inter-food interval (time between successful food captures) for 2,852 individuals. Regression analysis revealed that the variance in the interval was explained by species, age, food type, method, and habitat. Picking up was the most common foraging method (46%), followed by surface dipping (15%) and dunking (9%). Of the natural food items, intervals were longest for large food items (crabs, worms) and shortest for small items (crustaceans, insects). Inter-food intervals were shortest for the small, hooded gulls and longest for the larger gulls. Adult inter-food intervals were shorter than those of young for all species in all feeding situations except food paddling in Great Black-backed Gull, picking in Laughing Gull, and dipping in Black-headed Gull. In general, the disparity between adult and young was greatest for the large gulls.

SUGGESTED WAYS TO IMPROVE MONITORING OF CLIFF-NESTING SEABIRDS

Byrd, G. Vernon (Alaska Maritime NWR, 202 Pioneer Avenue, Homer, AK 99603) and Arthur L. Sowls (U.S. Fish and Wildlife Service, 1011 East Tudor Road, Anchorage, AK 99503)

The mechanics of setting up and operating a monitoring program for cliff-nesting seabirds seems straightforward, but experience has shown that there is more to it than meets the eye. To be

effective in detecting significant changes in populations or reproductive success, a great deal of care needs to be taken in plot selection (both the plot and the observation point), standardization of observation techniques, marking plots in the field, documenting plot locations on maps and photographs, and archiving data (e.g., ensuring documentation is in an accessible location and readily usable form). These items are discussed, and suggestions are made on how to set up a monitoring system.

GROWTH PATTERNS OF NESTLINGS OF *FREGATA MAGNIFICENS* ON SANTA MARGARITA ISLAND, B.C.S., MEXICO

Carmona, R., L. Moreno, and J. Guzmán (Depto. de Biología Marina Universidad Autónoma de Baja California Sur, Apartado Postal No. 219, La Paz, B.C.S., Mexico)

During June 1985, we started a project on the reproductive ecology of *Fregata magnificens* in Santa Margarita Island, B.C.S. (Lat 24° 30' N, Long. 111° W). As part of this project, we are working on the growth pattern of nestlings. At the start of our fieldwork, there were eggs and chicks ranging from just hatched to about 1.5 months old (900 g) present in the colony. The growth of 28 nestlings was recorded during three months, including the following variables: culmen, wing, wing span, length, tarsus, and weight. All variables except weight were fitted to a sigmoid curve. Weight, as in other marine birds, increased greatly before the growth of the flight feathers, reaching values well over those for adults. During the growth of primary feathers, the weight decreased and, at fledging, the weight of the young birds was about the same as the weight of adult birds.

EGG NEGLECT IN CASSIN'S AUKLETS (*PTYCHORAMPHUS ALEUTICUS*)

Carter, Harry R. (Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, CA 94970), and D. Michael Fry (Dept. of Avian Sciences, Univ. of California, Davis, CA 95616)

In 1984 and 1985, we studied egg neglect in Cassin's Auklets on S.E. Farallon Island, California. Nest boxes were checked for 2 days after eggs were laid and every 2 of 4 days from Day 14 to hatching in 109 and 140 sites each year. Eggs were neglected mainly at laying (12.3% and 6.5% of days checked) and infrequently during incubation (1.8% and 1.2% of days checked) in each year. Late eggs (mainly relays) were neglected more frequently (41.1%) than early eggs (24.6%) in both years. Females neglected eggs more often than males only at laying in 1985. Eggs neglected at laying had reduced hatching success (20.0%) compared to those neglected during incubation (66.7%) and unneglected eggs (68.6%) which had similar success. Eggs were neglected more often in 1984 because prolonged periods of high winds presumably affected foraging conditions at sea. In 1985, egg neglect also was reduced by more two-day incubation shifts, mainly by males.

SEXUAL DIMORPHISM, REPRODUCTIVE SUCCESS AND CHICK GROWTH OF BROWN NODDIES NESTING ON CULEBRA, PUERTO RICO

Chardine, John W., Ralph D. Morris (Dept. of Biological Sciences, Brock Univ., St. Catharines, Ontario, Canada L2S 3A1), and Fred Schaffner (Dept. of Biology, Univ. of Miami, Coral Gables, FL 33124)

Fifty-one breeding brown noddies (*Anous stolidus*) comprising 16 pairs and 19 single birds were captured at the nest, measured, and color-banded in May-June 1985. Most pairs were characterized by marked sexual dimorphism in head-plus-bill length, mass, and wing length. Males were

assumed to be the larger of the two birds in a pair. The body condition index (defined as mass/head plus bill) of males was significantly higher than that of females. There was a significant positive correlation between male and female body condition index within the same pair. Thirty-four clutches (all one-egg) were monitored. Egg-laying took place between April 28-June 8 but 59% of eggs were laid over a four-day period between May 10-14. Thirty-three of 34 eggs hatched (97%) and 2 of 33 chicks (6%) were known to have died. Growth was monitored in 39 chicks. Mass increased linearly from 5 to 30 days at a mean rate of 4.5 g day^{-1}. Most chicks decreased in mass after 30 days. In contrast, growth in wing length and head-plus-bill was positive throughout the 50-day age range over which chicks were measured.

PATTERNS OF DISTRIBUTION OF DIURNALLY ROOSTING GULLS IN A COASTAL MARINE ENVIRONMENT

Chilton, Glen, and Spencer G. Sealy (Dept. of Zoology, Univ. of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2)

Barkley Sound, British Columbia, is an important stopover site for migrating California Gulls (*Larus californicus*) and several other seabird species. The Sound also supports a resident population of the Glaucous-winged Gull (*L. glaucescens*). When not feeding, most gulls roost communally. The distribution of individuals between appropriate roosting sites is a function of prey behavior, opportunities to feed by local enhancement, and species differences in foraging ecology. The average roosting flock size of the California Gull, a fish-feeding specialist, was 22.5 individuals on 55 transects. As an intertidal forager, the Glaucous-winged Gull occurred in smaller groups that averaged 4.7 individuals on 102 transects. When fish schools became a less reliable resource, flocking tendency decreased in both species, and individual foraging was emphasized over flock feeding.

WATERFOWL AND FORAGE PRODUCTION ON BACKFLOODED HAY MEADOWS IN WESTERN CANADA

Clay, Robert T., and Jeffrey W. Nelson (Dicks Unlimited Canada, 1190 Waverley Street, Winnipeg, Manitoba Canada R3T 2E2)

Although Ducks Unlimited Canada concentrates on developing habitat for breeding waterfowl, many of our projects provide additional benefits for those on whose land our projects are built. Spring backflooding of native sedge meadows, followed by midsummer drawdown, provides ideal habitat for breeding and nesting ducks while vastly improving native forage crops. In 1983, we conducted an evaluation of a backflood system constructed by Ducks Unlimited in central Alberta. Breeding pair densities, on the basis of flooded area, varied from 1.9 on backflooded, to 2.2 pairs/ha on nonbackflooded habitats. Early-nesting species nested later than expected, while mid- and late-nesting species initiated nests soon after drawdown. Brood densities on backflooded habitats ranged from 0.5-7.6 broods/ha as compared to 0.1-1.7 broods/ha on other areas. Forage production increased from 2,376 ± 344 kg/ha to 5,016 ± 904 kg/ha in response to spring backflooding. Hay harvested during early August yielded 7.8 ± 0.4% protein and 59.2 ± 0.4% total digestible nutrients. Thus, spring backflooding improves habitat conditions for breeding ducks while increasing forage yields for local landowners.

ENERGY REQUIREMENTS OF FREE RANGING LITTLE PENGUINS, *EUDYPTULA MINOR*

Costa, Daniel, Peter Dann, and William Disher (Long Marine Laboratory, Univ. of California, Santa Cruz, CA 95064; Penguin Reserve Committee of Management, Phillip Island, Cowes VIC, Australia 3922)

Onshore and at-sea metabolism and water turnover of Little Penguins, *Eudyptula minor*, attempting to breed during September 1984 on Phillip Island, Australia, were measured using the doubly labeled water method. Water influx of two penguins fasting onshore was 18.1 ml $kg^{-1}d^{-1}$, with a CO_2 production of 0.903 ml $kg^{-1}h^{-1}$, corresponding to an energy expenditure of 1.31 kJ $kg^{-1}d^{-1}$ or 1.3 times the standard metabolic rate (SMR). Estimates of at-sea food consumption were derived from water influx measurements coupled with data on dietary composition and quality. Mean water influx of two birds at sea was 146 ml $kg^{-1}d^{-1}$, with a CO_2 production of 1.479 ml $kg^{-1}h^{-1}$, for an average daily metabolic rate (ADMR) of 916 kJ $kg^{-1}d^{-1}$, 2.15 times SMR. The metabolic cost at sea was estimated from ADMR and onshore attendance data and was 1,058 kJ $kg^{-1}d^{-1}$ or 2.5 times predicted SMR. Funded by University Research Expeditions Program (UREP), NSF DPP Grant #8311799 and NOAA grant NA80AA-D-00120.

SELECTIVE FACTORS AFFECTING CLUTCH SIZE IN THE WESTERN GULL ON THE FARALLON ISLANDS, CALIFORNIA

Coulter, Malcolm C. (Savannah River Ecology Laboratory, P. O. Drawer E, Aiken, SC 29802)

Western Gulls, like most gulls, usually lay clutches of three eggs. I examined selective factors affecting clutch size during both the egg and chick stages. I moved eggs and chicks among nests to create clutches and broods that were artificially larger and smaller than the usual three. Western Gulls are highly adapted to care for three eggs. They have three brood patches. They tended to sit for longer spells on three eggs than on larger or smaller clutches, and the incubation period was shortest for three-egg clutches. Hatching success was highest for three-egg clutches. During the chick stage, parents could raise more than three chicks. The greatest number of chicks fledged from five-chick broods. Chicks from the larger broods weighed less than chicks from the smaller broods. When the results from the egg and chick stages are combined, the greatest mortality occurred during the egg stage. I suggest that, at some time in the past, Western Gulls evolved three-egg clutches, and that the gulls have since become highly adapted to care for three eggs. These adaptations presently exert selection pressure maintaining the three-egg clutches.

THE ROLE AND POTENTIAL OF MAN-MADE AND -MODIFIED WETLANDS IN ENHANCEMENT OF THE SURVIVAL OF OVERWINTERING SHOREBIRDS

Davidson, Nicholas C., and P. R. Evans (Dept. of Zoology, Univ. of Durham, Science Laboratories, South Road, Durham DH1 3LE, England)

In N.E. England, most of the annual mortality of several shorebird species occurs in winter, particularly during windy and cold weather. On the Tees estuary, extensive reclamation of intertidal land, during the last 150 years, has produced a variety of man-modified wetlands bordering the remaining mudflats. The use of such wetlands as supplementary feeding sites during severe winters will be discussed. Based on these findings and on observations of feeding behavior of different shorebird species, guidelines have been established for the creation of feeding areas for shorebirds, to ameliorate losses of intertidal land. Experiments on the colonization of such

areas by estuarine invertebrates will be described, and the importance of creating sites several years before natural flats are to be lost will be emphasized.

NOAA DATA ATLASES OF THE COASTAL AND OCEAN ZONES: MARINE BIRDS

Divoky, George J., Thomas F. LaPointe, Tracy A. Gill, and Karen M. Chesnutt (Strategic Assessment Branch, NOAA, 11400 Rockville Pike, Rockville, MD 20852)

The Ocean Assessments Division of NOAA is compiling a series of regional data atlases that characterize the coastal and ocean zones of the U.S. The atlases present information on the physical and biological components of marine systems as well as data on human economic activity and environmental quality. A West Coast and Gulf of Alaska Data Atlas is currently being compiled and will treat over 35 bird species. Included are species representing a wide range of habitats, from shorelines to pelagic waters off the continental shelf. The atlases inform resource managers of the abundance and importance of marine birds and identify areas where human pollution and activities are most likely to impact marine ecosystems. Final products from east coast and Gulf of Mexico atlases are presented, as well as preliminary products from arctic and west coast atlases.

LATE FALL MOVEMENTS OF IVORY GULLS AT POINT BARROW, ALASKA

Divoky, George J., Peter Woodman, and Karen Bohuski (Institute of Arctic Biology, Univ. of Alaska, Fairbanks, AK 99701)

While many authors still consider the Ivory Gull to be an uncommon straggler in Alaskan waters, there is extensive evidence that both nearctic and palearctic breeding populations move through the Chukchi Sea to winter in the Bering Sea. Little is known of the nature and timing of these movements, however. In October 1984, we observed the fall migration of Ivory Gulls at Pt. Barrow, Alaska. Ivory Gulls were not regularly seen until 12-13 October when an estimated 200 birds, apparently from the Soviet arctic, moved eastward into the Beaufort Sea. Low levels of passage to the east and west occurred for the next six days until 20 October when an estimated 450 birds passed westward into the Chukchi Sea. The latter passage apparently consisted of Canadian birds as well as the birds that had earlier moved to the east. The eastward movement early in the migration indicates that the species may feed in the area of high productivity in the western Beaufort Sea used by other surface-feeding species earlier in the fall. Age differences between birds involved in the eastward and westward passages are discussed.

WATERBIRD USE AND AVIAN TIME BUDGETS OF A WETLAND SYSTEM CREATED PRIMARILY FOR THE CONTROL AND TREATMENT OF URBAN STORMWATER RUNOFF

Duffield, Joan (125 Meadow Lane, Orinda, CA 94563)

Stormwater detention facilities are built primarily for flood control; these structures, however, can also provide valuable habitat for wildlife. Little research has been done with respect to the species and numbers of waterbirds using these artificial wetland systems. To evaluate the waterbird usage of such a man-modified wetland, censuses were conducted at DUST (Demonstration for Urban Stormwater Treatment) Marsh located at Coyote Hills Regional Park, Fremont, California. Weekly censusing extended from January to June 1984 and November 1984 to January 1985. Biweekly censusing continued from June to November 1984.

The study site consists of three marsh subunits which are different in size, shape, water depth, and amount of vegetation. The censusing data was used to compare the avian use of these separate marshes. Additionally, this census data was compared with data collected from surveys conducted at Main Marsh, also located within Coyote Hills Regional Park.

HERON COLONIES OF MONTGOMERY, ALABAMA, 1985

Dusi, Julian L. (Dept. of Zoology-Entomology, Auburn Univ., Auburn University, AL 36849)

Montgomery, Alabama, is situated on the fall line, with the blackbelt prairie province to the south and the Piedmont to the north. The Alabama River, with many oxbows, runs through the north side. The heron colonies include a Great Blue Heron colony, located on the southern edge. It is in the blackbelt and consists of 13 nests, located in a dead osage-orange tree in the middle of a tiny pond. A Black-Crowned Night-Heron colony of about 30 nests is located in a residential area within the city near the Normandale shopping center. A Cattle Egret/Little Blue Heron colony is located on an island in the Alabama River at the northwestern edge of the city. In addition to Cattle Egrets and Little Blue Herons, it also contains a few Snowy Egrets and White Ibises. It is unique for this many heron colonies, with this diverse a species group to be found in, or near, any coastal plain city in Alabama.

LONG TERM ORGANOCHLORINE TRENDS IN SEABIRDS FROM THE WESTERN NORTH ATLANTIC

Elliott, John E., David B. Peakall (Canadian Wildlife Service, National Wildlife Research Center, Ottawa, Canada K1A 0E7), and Peter A. Pearce (Canadian Wildlife Service, Fredericton, New Brunswick, Canada E3B 4Z9)

Eggs collected from three seabird species (double-crested cormorant, common puffin, Leach's petrel) at four-year intervals, 1968-1984, from colonies in eastern Canada were analyzed for organochlorines. Monitoring was carried out to determine the threat to seabird health and as an index to contamination of the marine ecosystem. Long-term trend data is presented for six organochlorines. DDE and PCB's declined significantly in three species from the Bay of Fundy and in two species from the outer continental shelf. DDE declined more than PCB's. Dieldrin and oxychlordane levels decreased at some locations and were stable at others. HCB and heptachlor epoxide levels remained steady or increased significantly depending on the species and location. With the exception of DDE, which decreased slightly, organochlorine levels in cormorants from the St. Lawrence estuary were stable or increased significantly. There is currently no evidence of health effects associated with organochlorines in Canadian Atlantic seabirds.

A CLOSER LOOK AT DENSITY-RELATED DEPRESSION OF REPRODUCTION IN SEABIRDS

Eppley, Z. A., and G. L. Hunt, Jr. (Dept. of Ecology and Evolutionary Biology, Univ. of California, Irvine)

Previously we reported reduced reproductive output and the production of lower weight offspring among kittiwakes and murres breeding in large colonies than in small colonies. We have reexamined this relationship, using partial correlation to partition the independent effects of species population size, the size of potential competitor populations, and total colony size. Negative correlations between reproductive output and population size indicate competition within a

species for food resources, while negative correlations with the size of potential competitor populations ("effective colony size") indicate competition between species for a shared prey. Competition for nest sites is important but should affect population size and the composition of colony rather than directly affecting the success of breeding pairs. We found significant negative correlations between reproductive output and population size, but no significant correlations with "effective population size" or total colony size. Our results are consistent with a mechanism of interference between individuals of a species feeding together. The shape of the function relating reproductive output to population size is expected to differ among species depending on the degree of flocking during feeding (which may also be population size dependent) and prey biology.

MULTISPECIES USE OF BRACKISH IMPOUNDMENTS MANAGED FOR WATERFOWL

Epstein, Marc B., and R. L. Joyner (Tom Yawkey Wildlife Center, Route 2, Box 181, Georgetown, SC 29440)

Waterbird counts and behavioral observations were made on waterfowl impoundments and tidal marshes during 19 months, January 1983 to July 1984. Among 1,544 censuses, 81 species were recorded and categorized into 78 bird groups for analysis (ANOVA); 44 (56%) had ≥ 300 use-days overall. Multiple regression indicated that water level was inversely ($R^2 = 0.60$, $P < 0.0001$) related to bird use on impoundments but particularly during spring ($R^2 = 0.85$, $P < 0.0001$). Average species richness was higher on managed units (57) vs. tidal sites (43). Significantly ($P < 0.05$) more birds used impoundments in all seasons except summer. Shorebirds dominated (53%) the use of impoundments, followed by waterfowl (27%), waders (14%), and other waterbirds (6%). Impoundment use by birds was season- and management-related, and provided a higher and more diversified utilization than unmanaged sites. The results imply that: (1) waterfowl management options and water-level manipulations can benefit a variety of nongame species, and (2) slight alterations of traditional waterfowl management in South Carolina may greatly enhance resource availability to many waterbirds and still maintain high waterfowl utilization.

ASPECTS OF THE CONDITION OF WINTERING COMMON TERNS IN TRINIDAD

Erwin, R. Michael, Gregory J. Smith (Patuxent Wildlife Research Center, Laurel, MD 20708), and Roger B. Class (Biol. Survey Section, USFWS, Nat. Mus. Nat. Hist., Washington, D.C. 20560)

Eighty-nine Common Terns, *Sterna hirundo*, were captured in Trinidad in January and March 1985 as part of a study of physical condition, mortality, and feeding ecology in winter. Eleven birds had been banded, all as young, the previous summer suggesting that a high proportion of the Trinidad population is comprised of immatures. Mean weights were 102 g, considerably less than those of pre-migratory immature or adult terns in the U.S. All but two birds were molting, with mean molt score higher in March than January. One-half the captured birds had at least traceable amounts of oil on their plumage, a much higher prevalence than has been previously reported for seabirds. However, oiling did not appear detrimental since oiled birds had similar weights and molt scores to unoiled birds. Analyses of blood components and lipids are discussed in relation to other indices of overall conditions.

USE OF THE HERBICIDE "DALAPON" FOR CONTROL OF *SPARTINA* ENCROACHING ON INTERTIDAL MUDFLATS: BENEFICIAL EFFECTS ON SHOREBIRDS.

P. R. Evans (Dept. of Zoology, Univ. of Durham, Science Laboratories, South Road, Durham DH1 3LE, England)

The cord-grass *Spartina anglica* arose from cross-fertilization between *S. alterniflora*, introduced from the U.S.A., and the native *S. maritima*, near Southampton, England, about 100 years

ago. As a result of natural colonization and deliberate planting to reclaim intertidal land, it spread to occupy some 12,000 ha of the British coastline by 1967. In some areas which hold large wintering populations of shorebirds and wildfowl, it is still spreading rapidly and reducing the amount of open intertidal mudflats. On the Lindisfarne National Nature Reserve, northeast England, the seaward edge of the *Spartina* sward has been sprayed with "Dalapon" (sodium dichloropropionate) each summer for four years. Use by birds of the areas cleared by spraying will be documented and compared with the use of areas of (i) *Spartina* swards and (ii) open mudflats that have never been colonized by *Spartina*, at the same tidal heights as the treated areas. Increased use of the sprayed areas will be related to changes in mudflat invertebrate populations.

A SIMULATION MODEL OF FLOCK FORMATION IN RING-BILLED GULLS

Evans, Roger M. (Dept. of Zoology, University of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2)

Previous studies suggest that gull flocks arise from social facilitation of flight superimposed upon otherwise random departure times. A simulation model, based on these assumptions, is developed employing three variables (1) probability of being facilitated, (2) amount of time facilitated, and (3) time span over which facilitation can occur. Simulations using a range of values for these variables were compared with results of 12 actual data sets. A wide range of probability of following provided a close fit to the actual data, but the amount of time facilitated rarely exceeded 80% of the time separating successive birds, as expected for gulls that "straggle" out in loose flocks. The best fit to the data was when facilitation acted over the biologically reasonable time of about 1 min. I conclude that the three variables modelled provide a realistic first approximation in this species.

RESOURCE USE BY FOUR SPECIES OF HERONS IN NATURAL AND IN AGRICULTURAL HABITATS IN ITALY

Fasola, Mauro (Dipartimento Biologia Animale, Pz. Botta 9, I-27100 Pavia, Italy)

Rice fields provide food for about one-half of the Night Herons and one-third of the Little Egrets breeding in Italy, thus maintaining the highest population of these species of any European country. In rice fields, the feeding niches of Egret, Night Heron and Grey Heron overlap considerably as regards microhabitat, prey type, and activity rhythm; the herons aggregate during foraging and no competitive interactions occur; food is clumped and superabundant. In rivers and marshes, on the other hand, these herons segregate by macrohabitat (Purple Heron from Little Egret). Cultivation techniques influence the use made of rice fields by herons. Priorities in the conservation of suitable sites for heronries (probably the limiting factor in Northern Italy) can be assessed from the dispersion of the feeding habitats.

SEASONAL VARIATION OF NUMBERS OF SHOREBIRDS OF THE FAMILIES SCOLOPACIDAE AND CHARADRIIDAE' IN THE LAGOON OF BARRA DE NAVIDAD, JALISCO, MEXICO

Flores, J. (Laboratorio de Ciencias Marinas, Universidad Autónoma de Guadalajara, Apdo. #3, Barra de Navidad, Jalisco, México)

Barra de Navidad is a wintering station for many shorebirds migrating from the north. The study area is located in the south coast of Jalisco (Lat. 19° 15' N, Long. 104° 40' W) and consists

of a mangrove lagoon, where three observation areas were selected. Censusing was carried out twice a month, covering the three areas on different days, from October 1984 to October 1985. There was a sharp increase on shorebirds numbers, starting in September. Most of these birds stayed in the area until March. Although individuals of at least three species are seen almost year round. A total of 5 species of the family Charadriidae and 10 of the family Scolopacidae have been recorded.

FACTORS INFLUENCING THE FREQUENCY OF EXTRAPAIR COPULATION IN WHITE IBIS

Frederick, Peter C. (Dept. of Biology, Univ. of North Carolina, Chapel Hill, NC 27514)

Extrapair copulations (EPCs) are now reported in a wide variety of otherwise monogamous avian species, yet little is known about the conditions necessary for their occurrence. Intensive observations of the mating behavior of White Ibis in a coastal South Carolina colony revealed that EPCs were an important component of the mating system, and EPC rate varied considerably among study groups and seasons. This variation was found to be independent of nesting density, clutch size, and daily sex ratio. EPC frequency was significantly correlated with the time males were able to guard their females at the nest. Male guarding time was largely dependent on availability of food off the colony, and EPC frequency was thus indirectly influenced by local resource conditions. Finally, female cooperation emerged as a critical, but as yet unpredictable prerequisite for EPC behavior.

HEMATOLOGICAL EFFECTS OF BUNKER C FUEL OIL ON COMMON MURRES

Fry, D. Michael, Leslie Addiego, Steve Schwarzbach, and C. R. Grau (Department of Avian Sciences, Univ. of California, Davis, CA 95616)

The explosion of the oil tanker "Puerto Rican" on October 31, 1984, spilled an estimated 1.3 million gallons of mixed petroleum products 25 miles west of San Francisco. More than 1,300 oiled birds were recovered, and live birds were taken to rehabilitation centers. Twelve oiled common murres were studied for 7-14 days. Blood samples were taken every other day to evaluate red and white blood cell parameters. Initial hematocrits fell into three distinct groups: normal, subnormal, and low and appear to be related to the amount of oil ingested by the bird. Murres were released after rehabilitation with hematocrits depressed by 30%. High-vacuum distillation mass spectroscopy was employed to identify the type(s) of oil encountered by the birds. Most birds in this study were contaminated with bunker C, a residual fuel containing high amounts of polynuclear aromatics. Red blood cells were studied using scanning electron microscopy and abnormal cells were found indicative of Heinz-body hemolytic anemia. The white blood cell (WBC) profile was one of marked heterophilia and lymphocytopenia, but WBC counts were within normal limits. Changes in WBC differentials appear to be stress-related. This study confirms that toxic effects of oil include decreased red blood cell numbers and altered morphology. Anemia and stress-related white cell changes may compromise the survival of oiled birds and should be considered when releasing rehabilitated sea-birds. This work was supported by U.S.D.I. Minerals Management Service Contract #14-12-0001-2911/SB0408(a)-81-C-0509 awarded to Nero & Assoc., Portland, Oregon.

INFLUENCE OF BREEDING SUCCESS ON MATE FIDELITY IN WEDGE-TAILED SHEARWATERS

Fry, D. Michael, J. Swenson, L. A. Addiego, and C. R. Grau (Dept. of Avian Sciences, Univ. of California, Davis, CA 95616)

Shearwaters are long-lived seabirds with a complex, prolonged breeding season. If successful, breeding pairs will maintain a stable bond for many seasons, returning to the same burrow or part of the colony each year. In experiments designed to assess the effects of exposure to small amounts of crude oil, we have observed breeding failure and disruption of fidelity of birds breeding on Manana Island, Hawaii. Analysis of data from 200-400 pairs of shearwaters during three breeding seasons reveals that breeding success influences mate fidelity. Pairs of birds which do not lay or which lose eggs have poor mate fidelity in the subsequent year. Many pairs lose chicks during the hatchling period, but mate fidelity of pairs losing chicks is not different from that of pairs which are successful in raising a chick to fledging. Successful incubation, rather than successful chick rearing, appears to be critical in preserving the pair bond. The memory of a successful season may be triggered by a cue linked to hatching. This work was supported by U.S.D.I. Minerals Management Service Contract #14-12-0001-29112/SB0408(a)-81-C-0509 awarded to Nero & Assoc., Portland, Oregon.

DEMOGRAPHICS AND TOXICOLOGY: SEX RATIO SKEW AND BREEDING PATTERNS OF GULLS

Fry, D. Michael, C. Kuehler Toone (Dept. of Avian Sciences, U.C. Davis, CA 95616), Steven M. Speich, and R. John Peard (Cascadia Research Collective, 218 W. Fourth Avenue, Olympia, WA 98501)

The sex ratio within a gull colony skewed to females results in female-female pairs identified by supernormal clutches (SNC) and indexed by SNC percentage within a colony. Causes of skewed sex ratios may be multifactoral. Expanding populations forming new colonies have SNC arising presumably from greater dispersion of females from their natal site. Declining populations in areas polluted with organochlorines (OC) show a decrease in breeding males and up to 15% of SNC. Population change is predictive of both SNC incidence and sex ratio skew. OC exposure in California and the Great Lakes has been experimentally duplicated by injecting OC into gull eggs, causing abnormal development of both male and female embryos. Males are feminized with germ cells located in the cortex of the gonad. Females develop both right and left oviducts. Persistent right oviducts in adult female Glacous-winged Gulls correlate with pollutant exposure and SNC in Puget Sound, Washington.

DO ADULT GULLS RECOGNIZE THEIR OWN YOUNG: AN EXPERIMENTAL TEST

Galusha, Joseph G., and Ronald L. Carter (Dept. of Biol. Sci., Walla Wall Coll., Coll. Place, WA 99324)

Adult gulls are reported to recognize their own chicks by the time they are five or six days old (Tinbergen, 1953). We experimentally tested this hypothesis by allowing single chicks to live on their own territory for between 3 and 30 days before being rotated to another test territory. To prevent straying by the chicks, a chicken-wire fence, 9" high and enclosing 1 m square, was placed around each nest at time of hatching. With one exception, 25 parent gulls offered food to chicks within three hours of manipulation. After nine days of age, chicks showed various degrees

of concern during the first hour after being switched but accepted food within four hours. Subsequently, we rotated five chicks between five territories once each day for 30 days. They were then placed on natural, control territories. These chicks begged for food, were fed and accepted in 9 of 10 trials. We conclude that Glaucous-winged gulls do not recognize their own chicks, individually.

EGG FORMATION IN THE SHAG (*PHALACROCORAX ARISTOTELIS*)

Grau, C. R. (Dept. of Avian Sciences, Univ. of California, Davis, CA 95616)

Yolks of shag and cormorant eggs are small, the yolk material being deposited slowly and evenly in distinct daily rings. Lag time between yolk completion and laying was studied on the Isle of May, Fife, Scotland, by feeding females lipophilic dye, collecting the eggs, freezing, fixing, and staining the yolks, counting the rings, and noting the time-marked ring in relation to yolk completion and laying. The lag was 3.1 ± 0.6 days in 14 eggs; the total time of yolk formation was 13.6 ± 1.1 days. Yolk mass: 72 g; egg mass: 48.3 g. Eggs were usually laid three-four days apart. Two of 13 dosed females laid five eggs each, one in 13 days, the other in 14 days.

DISTRIBUTION OF SEABIRDS IN THE BAY OF LA PAZ, B.C.S., MEXICO

Guzmán, J., C. Jiménez (Departamento de Biología Marina Universidad Autónoma de Baja California Sur, Apartado Postal No. 219, La Paz, B.C.S., México), and E. Amador (Centro de Investigaciones Biológicas de Baja California Sur A.C., La Paz, B.C.S., México)

Fieldwork has been conducted in the Bay of La Paz, B.C.S. (Lat. 24° 30′ N, Long. 110° 35′ W) from October 1984 to October 1985. Pelagic and coastal census have been done every month in order to determine the patterns of distribution of all the species of seabird present. We have also examined the seasonal variation (numbers and diversity) as well as in the species that breed. The pelagic censuses consisted of three transect lines forming a triangle and covering most of the Bay. The coastal censuses were conducted from a skiff moving between 50 and 200 m from the shoreline and covering the west and east side of the Bay in two different trips.

USE OF ARTIFICIAL AND NATURAL WETLANDS AS FEEDING SITES BY LITTLE EGRETS (*EGRETTA G. GARZETTA L.*) IN CAMARGUE, SOUTHERN FRANCE

Hafner, Heinz (Station Biologique, La Tour du Valat, Le Sambuc, F-13200 A R L E S, France)

Three types of feeding habitat were studied. Ricefields were exploited by *E. garzetta* mainly during the hatching period (June). At this time, the fields have a high density of invertebrates, and the birds achieve high peck-success rates. After June, rice growth renders these habitats unsuitable. The second type of man-made wetland was provided by flooding 30 hectares of abandoned farmland from March to September and by applying various management practices. There were marked differences in bird use between individual fields, which can be related both to prey supply and to vegetation structure. In both artificial wetland types, fish were scarce or absent. Natural freshwater marshes, in which fish were normally the main prey, were used throughout the breeding season. In July and August, when fish became more concentrated because of dropping water levels, Egrets caught fewer but larger prey than during the previous months.

INFLUENCES OF PARENTAL BEHAVIOR ON REPRODUCTIVE SUCCESS

Hanners, Lise A. (Biology Dept., Univ. of South Florida, Tampa, FL 33620)

Behavior of Laughing Gulls (*Larus atricilla*) breeding in a colony in Tampa Bay, Florida, was observed during 1982-84. In 1982, 19 pairs from one study site were successful (raised at least one chick to mean asymptotic weight); 12 pairs were unsuccessful. Beahvior of successful (S-parents) and unsuccessful (U-parents) was compared using loglinear and two-way contingency analyses. Frequencies of incubation, brooding, presence-absence, standing over the nest, standing on territory, and feeding were compared. The nesting season was divided into three stages: stage 1 (incubation to hatching), stage 2 (hatching to day 6), and stage 3 (days 7-14). During stage 1, incubation frequencies of S- and U-parents were similar, but S-parents were more attentive at the nest. In stage 2, U-parents were more frequently absent, stood over their nests rather than brooding, and stood on territory leaving the nest unattended. S-parents brooded more and, when one adult stood on territory, the other attended the nest. In stage 3, the frequencies of brooding, standing on territory, and absence were the same, but U-parents more frequently left the nest unattended. Most mortality occurs in stage 2 when differences in attendance are most pronounced.

AN EXAMINATION OF FRONTS AFFECTING THE DISTRIBUTION OF LEAST AUKLETS IN THE CHERIKOV BASIN

Harrison, Nancy M. (Dept. of Ecology and Evolutionary Biology, Univ. of California, Irvine CA 92717)

The prey of seabird species has been found in high densities at oceanographic fronts. Some seabird species may require a critical prey density, making prey aggregations at fronts a very important component of the marine environment. Because the term "front" describes a variety of physical phenomena at varying temporal and spatial scales, it is difficult to generalize the mechanisms making fronts important. I studied two fronts in the northern Bering Sea with the intent of finding the specific characteristics which make for enhanced prey availability for Least Auklets (*Aethia pusilla*). I studied hydrography and auklet distribution at a fine-scale. Using acoustic surveys and plankton nets, I examined the biomass, vertical distribution, and species composition of the plankton. My data suggests that stable fronts with very strong property gradients are more likely to attract Least Auklets. The specific nature of the circulation, the stability, and the magnitude of the property gradients are all important characteristics of fronts that affect the distribution of prey.

TIME ALLOCATION BY NORTHERN FULMARS DURING THE BREEDING SEASON

Hatch, Scott A. (U.S. Fish and Wildlife Service, 1011 E. Tudor Road, Anchorage, AK 99503)

The allocation of time by Northern Fulmars to on-land and at-sea activities was quantified in six years by assuming that the percentage of birds at nest sites on a given day of the breeding cycle was an estimate of the percentage of time spent on land at that stage. In general, the amount of time birds spent on land was positively correlated with annual breeding success, suggesting that time allocation was a sensitive indicator of food availability in different years. The length of incubation shifts, and the ratio of male to female shares in incubation were negatively correlated with annual breeding success. Males spent more time on land than females at all stages of the nest cycle, but changes in body weight suggested neither sex operated at an energetic deficit on a seasonal basis. Rather, a greater investment by males in nest site attendance during incubation

offset the female's investment in egg production and enabled both sexes to enter the demanding chick-feeding stage in good condition.

ASYNCHRONOUS HATCHING IN HERRING GULLS: CHICK GROWTH SURVIVORSHIP AND BROOD REDUCTION

Hébert, Percy N., and Robert M. R. Barclay (Zoology Dept., Univ. of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2)

In this study, we examined the effects of asynchronous hatching on Herring Gull chick growth and survivorship with respect to Lacks (1954) brood reduction hypothesis. Twenty-eight nests containing manipulated clutches which hatched synchronously (A-C hatch interval 24 h) were compared to 15 control (natural three-egg) nests. At hatch, all chicks had similar weights except for the control C-chick which hatched lighter and, subsequently, grew slower than its nest mates and the experimental C-chick. In control broods, C-chicks disappeared first significantly more often than its elder sibs, whereas in experimental broods there was no difference in the proportion of A-, B-, or C-chicks disappearing first. Survivorship up to 40 days post hatch was lowest for C-chicks in control broods and similar for all chicks in experimental broods. There was a trend for control A- and B-chicks to survive longer than experimental A- and B-chicks. These results support Lack's brood reduction hypothesis in that they show that in the absence of a size and age hierarchy, parents dispense resources inefficiently and hence the survivorship of the older more fit chick(s) is reduced.

POSTBREEDING DISTRIBUTION AND HABITAT USE OF FOUR SPECIES OF WADING BIRDS IN OKLAHOMA

Heitmeyer, Mickey E. (Oklahoma Cooperative Wildlife Research Unit, 404 LSW, Oklahoma State University, Stillwater, OK 74078)

The abundance, geographical and habitat distribution, and habitat selection factors of great blue herons (*Ardea herodias*), little blue herons (*Egretta caerulea*), green-backed herons (*Butorides striatus*), and cattle egrets (*Bubulcus ibis*) were studied in summer 1978 and 1979 following nesting, and of great blue herons in fall 1979, early and late winter 1979-80, and spring 1980 in Oklahoma. A stratified random sample of quarter sections of land area was used to sample wetland habitats and postbreeding wading birds. All four species utilized unmodified and natural palustrine wetlands and rivers more than expected relative to their abundance and water coverage in the state. Farm ponds with mud substrates and lacking submergent and emergent vegetation were especially avoided by wading birds. These ponds comprised approximately 80% of the statewide basins and 35% of the surface water area (excluding reservoirs) but contained less than 20% of the state's wading birds (excluding cattle egrets). Natural wetlands in riparian and floodplain regions appear especially important to postbreeding wading birds in Oklahoma.

COLONY EXPANSION AND FOOD HABITS OF DOUBLE-CRESTED CORMORANTS IN MINNESOTA

Hirsch, Katherine (Dept. of Natural Resources, 2115 Birchmont Beach Road N.E., Bemidji, MN 56601)

Colonies of cormorants have been monitored for 10 years by the Nongame Program. Number of nesting sites has increased to 26, and the state population is estimated at 14,000 birds, a significant increase from previous years. Food habits and productivity was also investigated. Analysis of

chick regurgitations revealed that game fish (Perch, Walleye, and Crappie) comprised up to 82% of the samples. Fish lengths averaged 5.82 cm. at the Chataqua Lake site, and 6.54 cm. at the Lake of the Woods site. Fish weights averaged 91.67 g. at Chataqua and 117.12 g. at Lake of the Woods. Frequency of occurrence and relative frequency of occurrence were also calculated. Productivity at the colony sites varied from 1.4 chicks/nest at Lake of the Woods to 1.8 chicks/nest at Chataqua. Data indicate that cormorant populations are expanding in Minnesota and that fish consumption is significant.

ESTIMATING RISK TO ALASKAN SEABIRD POPULATIONS FROM OFFSHORE OIL DEVELOPMENT

Hubbard, Joel D. (U.S. Dept. of Interior, Minerals Management Service, P. O. Box 101159, Anchorage, AK 99510)

Minerals Management Service (MMS) is responsible for assessing the potential consequences of petroleum development in the marine environment, monitoring animal populations to determine if they are affected by this activity and designing procedures to mitigate or eliminate any effects. To assess the vulnerability of marine birds to oilspills and to aid in predicting the potential effects on their populations, MMS utilizes a spill trajectory model whose output provides an estimate of risk (as probability of contact) to "target" areas of particular concern. In combination with estimated spill area and bird density, such information can be used to predict the immediate impact of individual spills. However, given the paucity of historical population data for most seabird concentration areas in Alaska, translation of such predictions into effects on regional populations is problematical at the present time. While the substantial variation in both biological and physical parameters involved in risk assessment tends to confound this process, use of the oilspill model provides a reasonable method for estimating risk to marine birds.

OBSERVATIONS ON THE HYBRIDIZATION OF THE HERRING GULL AND THE GLAUCOUS GULL IN ICELAND

Ingólfsson, A. (Institute of Biology, Univ. of Iceland, Grensasvegur 12, Reykjavik, Iceland)

I report here results from studies during the last 15 years on the extensive hybridization between the herring gull and the glaucous gull which resulted from the massive immigration of the herring gull to Iceland around 1925. Mate selection was found to be random with respect to several factors, but site tenacity had an effect. Herring gull-like birds (pure birds and hybrids) raise fewer young per nesting attempt than more glaucous gull-like birds whereas birds of intermediate appearance have a higher incidence of non-breeding than others. In spite of this, the population is not becoming more glaucous gull-like, probably as a result of continuing immigration of pure herring gulls from Europe.

DIETS OF GLAUCOUS-WINGED GULLS: A COMPARISON OF METHODS FOR COLLECTING AND ANALYZING DATA

Irons, David B. (U.S. Fish and Wildlife Service, 1011 E. Tudor Road, Anchorage, AK 99503)

Scientists collect data on the diets of gulls for many purposes. Depending on the objectives and the available resources, one or more methods of determining diets may be best. All four methods of collecting data have advantages and biases. My results showed that crop and/or gizzard contents provided some intact organisms, but crop contents were sometimes lost by

regurgitation. Observations supplied data for specific times and locations, but we were not able to identify some prey. Regurgitated pellets furnished sizes of organisms and a large sample size, but biased against soft-bodied prey. Food fed to chicks was obtained easily but varied from the adults' diets.

I analyzed the data using six methods: number, dry weight, volume, frequency of occurrence, the index of relative importance, and caloric value. All methods showed similar results in this case but, depending on the type of prey eaten, results could vary greatly. The manner of collecting data, the study objectives, and the prey types should determine what method of analysis is used.

COLONIAL WATERBIRD RESPONSE TO RECENT HIGH WATER LEVELS IN THE MALHEUR-HARNEY LAKES BASIN IN SOUTHEAST OREGON

Ivey, Gary L., and C. D. Littlefield (U.S. Fish and Wildlife Service, Malheur National Wildlife Refuge, P. O. Box 113, Burns, OR 97720)

Recent precipitation increases in the northern Great Basin has resulted in dramatic changes in colonial nesting species. The third largest of the pleistocene pluvial lakes is Malheur Lake, located on Malheur National Wildlife Refuge. Since 1982, the lake has increased in size from approximately 175,000 ha to over 296,000 ha. This increase resulted in island development and rural homesite flooding. Islands, flooded trees around homesites, and flooded riparian habitat has increased the availability of nesting sites for most colonial nesting species. Caspian Terns nested in 1983 and American White Pelicans nested in 1985. Neither of these species had nested in the basin since 1960. White-faced Ibis pairs increased from an average of 127 pairs (1966-81) to 913 pairs (1982-85), Great Egrets from 253 to 603 pairs, Snowy Egrets from 86 to 161 pairs, Great Blue Herons from 174 to 456 pairs, and Double-crested Cormorants from 80 to 565 pairs. Therefore, high water has benefited most colonial nesting species; however, Black-crowned Night-Herons and Franklin's Gulls have declined.

GREAT HORNED OWLS VS' CALIFORNIA GULLS: PREDATION IN TWO COLONIES

Jehl, Joseph R., Jr. (Hubbs Marine Research Institute, San Diego CA 92109), and Charles Chase III (Denver Museum of Natural History, Denver, CA 80205)

Great Horned Owls are important predators in California Gull colonies at Mono Lake, California, and Antero Reservoir, Colorado, although their behavior and impact differs. At Mono Lake, owls evidently begin hunting near their nest and, after disrupting nesting, move to more remote parts of the gull colony. They feed on adults until chicks become available, then shift to younger prey. One or two gulls are killed each night. At Antero Reservoir, owls hunt in the same area through the nesting season. The gulls remain, even though the owls apparently kill many more chicks than at Mono Lake. In subsequent seasons, however, gulls shift to localities that were not heavily hunted the previous year. Vacancies are filled by naive birds. We quantify the impact of the predators and present data on the age and sex ratios of their prey.

MAPPING OF WOOD STORK FORAGING HABITAT WITH SATELLITE DATA

Jensen, John R. (Dept. of Geography, Univ. of South Carolina, Columbia, SC 29208), Malcolm Coulter (Savannah River Ecology Laboratory, Aiken, SC 29802),Halkard E. Mackey, Jr. (Savannah River Laboratory, Aiken, SC 29808), and Michael E. Hodgson (Dept. of Geography, Univ. of South Carolina, Columbia, SC 29208)

Landsat Thematic Mapper data from May 1984 were used for a 1,520-square-kilometer section of north central Georgia to map potential forage sites for the endangered wood stork. Forage sites were identified and located as shallow water and/or marsh sites and acreages estimated. This technology may provide a suitable method to inventory and evaluate regional wetlands forage habitat for this wide-ranging species.

FOOD HABITS AND DISTRIBUTION OF THE BROWN PELICAN IN THE BAY OF LA PAZ, B.C.S. MEXICO

Jiménez, C. C., and J. R. Guzmán (Departamento de Biología Marina, Universidad Autónoma de Baja California Sur, Apdo. #219, La Paz, B.C.S., México)

Of all the species of Pelecaniformes in the Bay of La Paz, *Pelecanus occidentalis californicus* is the most abundant. The purpose of this project is to determine the distribution and food habits of this species in the above-mentioned area. The distribution has been studied by means of coastal and pelagic monthly censuses. The pelicans are distributed along all of the coast of the Bay, although they tend to concentrate in places close by to roosting areas or fishing activities. Food habits have been determined through the analysis of food disgorged by young and adult birds in the colony of Ballena Island in the Bay of La Paz. In their diet, we have identified species of fish that are also important as human food.

Among these species of fish are: *Scomber* spp., *Anchoa* spp., *Pomadasys* spp., *Orthopristis* spp., *Paralabrax* spp., *Diplectrum* sp., *Mugil* spp., and *Calamus* sp.

THE REPRODUCTIVE BIOLOGY OF CALIFORNIA GULLS NESTING ON HUMAN-MADE LEVEES IN THE SAN FRANCISCO BAY, CALIFORNIA

Jones, Paul A. (Dept. of Biology, San Francisco State Univ., 1600 Holloway Avenue, San Francisco, CA 94132)

The reproductive success of California Gulls nesting on human-made levees in the south San Francisco Bay was monitored during the 1983 and 1984 seasons. Although clutch size changed from 2.44 in 1983 to 2.77 in 1984, fledging success remained relatively constant. I refer to my findings on hatching success, nesting density, chick growth, and diet during the discussion of the breeding dynamics of this colony that has grown from a few pairs in 1980 to over 1,000 nests in 1985.

FLOUNDERS OR PHALAROPES (WATERBIRDS OF SAN FRANCISCO BAY: PAST AND PRESENT)

Kelly, Paul R. (Calif. Dept. of Fish and Game, P. O. Box 47, Yountville, CA 94599), Thomas E. Harvey (S.F. Bay NWR, P. O. Box 524, Newark, CA 94560), and Roy W. Lowe (U.S. Fish and Wildlife Service, Hatfield Marine Sci. Center, Newport, OR 97365)

Major changes in California's avifauna resulted when the tidal marshes of San Francisco Bay were destroyed or replaced with artificial nontidal wetlands. Waterfowl declined by one-half in the 40 years preceding 1918 as 150,000 acres of marshes were reclaimed. Salt marsh inhabitants like the California Clapper Rail, once so abundant as to be commercially hunted, were reduced to endangered status. With the construction of salt evaporation ponds, formerly uncommon species like the Black-necked Stilt increased to levels that now represent 90% of their coastal wintering populations in California. Likewise, major west coast breeding populations of American Avocets, Caspian Terns, Forsters Terns, and Snowy Plovers became established. The ponds also support significant numbers of Wilsons Phalaropes, Eared Grebes, Double-crested Cormorants, White Pelicans, and California Gulls. Wildlife managers now face the challenge of balancing responsibility for "newly-acquired" waterbird populations with efforts to restore historic wildlife.

FORAGING EFFICIENCY OF THREE SYMPATRIC *EGRETTA*

Kent, Donald M. (Biology Dept., Boston Univ., Boston, MA 02215)

The foraging efficiency of Little Blue Herons (*Egretta caerulea*), Snowy Egrets (*E. thula*), and Tricolored Herons (*E. tricolor*) was studied in Old Tampa Bay and Safety Harbor, Florida. Little Blue Herons had a higher striking efficiency than Snowy Egrets and Tricolored Herons, and Snowy Egrets had a higher striking efficiency than Tricolored Herons. Snowy Egrets had a higher striking efficiency when feeding with Stand than with other behaviors. Tricolored Herons were equally successful with all behaviors. Little Blue Herons had a higher striking efficiency in open-water and on shore than in pools. Tricolored Herons were more successful along the shoreline and in canals and pools than in openwater. Little Blue Herons and Tricolored Herons consumed more grams per minute than Snowy Egrets. Tricolored Herons had the highest calories per minute intake rate. Little Blue Herons had a higher intake rate of calories per minute than Snowy Egrets.

SPATIAL AND TEMPORAL ASPECTS OF FRANKLIN'S GULL FLOCKS

Kopachena, J. G. (Dept. of Zoology, Univ. of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2)

Franklin's gulls (*Larus pipixcan*) arriving and departing from a breeding colony were clumped in space and time. Daily changes in directional use and the number of directions used declined as the breeding season advanced. Temporal clumping was greatest in the evening. Arrivals were often more clumped and had shorter flock durations than departures. Most flights showed more than one pattern of flocking. Interbird distances were greatest for morning departures and afternoon arrivals. An increased temporal clumping of birds away from the colony, linear flight paths of departing individuals, and high call frequencies of birds in flight, suggests that social facilitation superimposed on random departure times is one causal explanation of flock formation. Variation in spatial and temporal clumping patterns indicate that the extent to which arrivals and departures are socially facilitated is associated with the time of day and flock destination.

THE RE-ESTABLISHMENT OF ATLANTIC PUFFINS (*FRATERCULA ARCTICA*) TO A FORMER BREEDING SITE IN THE GULF OF MAINE

Kress, Stephen W. (National Audubon Society and Laboratory of Ornithology, Cornell Univ., 159 Sapsucker Woods Road, Ithaca, NY 14850)

From 1975 to 1981, as part of a program to develop colony re-establishment techniques for Atlantic Puffins, 697 nestling puffins were transplanted from Great Island, Newfoundland to Eastern Egg Rock a former nesting island in Muscongus Bay, Maine. Here they were reared in artificial sod burrows and fed until they fledged. Ninety-six percent of the nestlings successfully fledged. After at least two years at sea, 13% of the fledglings returned at least once to Eastern Egg Rock and at least an additional 8% returned to Matinicus Rock, a small puffin colony 32 km east of Eastern Egg Rock. Thirty percent of two- and three-year-old puffins made at least one intercolony flight between Eastern Egg Rock and Matinicus Rock, but such movements declined to only 4% once the puffins reached five years old. The Eastern Egg Rock colony has slowly increased from 5 breeding pairs in 1981 to 19 pairs in 1985. Average age at first breeding increased from four years old in 1981 to six years old in 1985.

RESPONSES OF WADING BIRDS TO SEASONALLY-FLUCTUATING WATER LEVELS: STRATEGIES AND THEIR LIMITS

Kushlan, James A. (Dept. of Biological Sciences, East Texas State University, Commerce, TX 75428)

Wading birds (Ciconiiformes) may use a diversity of strategies to cope with the seasonal fluctuation of water levels characteristic of large tropical marshlands. In the Florida Everglades, these include breeding seasonality, population movement patterns, colony site selection, foraging effectiveness, and nesting tenacity. The limits of these strategies may be easily exceeded by water management practices resulting in repeated nesting failures, which in turn may lead to population decreases or to shifts in distribution. The exceeding of limits, which may be caused by rather subtle manipulations, can therefore have profound effects on population stability, as has been documented in the Everglades.

INTERIOR LEAST TERNS IN THE LOWER MISSISSIPPI RIVER AND ITS TRIBUTARIES

Landin M., J. Rumancik, G. Parks, and S. Clark (U.S. Army Engineer Waterways Experiment Station (CE), Box 631, Vicksburg, MS 39180-0631)

When the Fish and Wildlife Service (FWS) gave notice that it was listing the interior least tern (*Sterna altillarum athalassos*) as endangered, the CE began to survey rivers within its jurisdiction to locate colonies and collect data on life requirements to determine if dredging and permit work was affecting tern populations. Two years' surveys and much coordination with FWS and seven state agencies have been made. In 1984, during unusually high river stages, the CE made a mid-July aerial survey of 311 river miles (RM) from Memphis to Cape Girardeau; we found an estimated 525 terns. In 1984, we flew two surveys: (a) mid-June during high river stages and inclement weather which covered 1,143 RM of the Mississippi, Red, Arkansas, and White Rivers; and (b) mid-July at lower river stages which covered 816 RM of the Mississippi, Arkansas, and White Rivers. We found between 200-300 terns in June, but in July found 1,334 terns from Vicksburg to Cape Girardeau, many around nesting sites. Four state agencies and the CE have

conducted ground truthing, and the CE also made a late June 1985 boat survey where over 500 terns were sighted. We will discuss data, future plans, and impacts on CE navigation work.

WATERBIRD COLONIES ARE ESTABLISHED AND GROWING ON GAILLARD ISLAND CDF

Landin, M., J. W. Webb, and S. Parrish (U.S. Army Engineer Waterways Experiment Station, P. O. Box 631, Vicksburg, MS 39180-0631)

In 1980-81, Mobile CE District built a triangular, 640-acre, 50-year life, confined disposal facility (CDF) two miles out in lower Mobile Bay with broad, sandy, gently sloping dikes. Waterbirds roosting on the CDF dikes immediately, while construction was still underway. By 1981, an estimated 4,000 gulls, terns, and skimmers were nesting on the dikes. These increased in 1982 to an estimated 7,000 birds. In 1983, an estimated 12,000 birds, including approximately 8,000 laughing gulls, were found at 13 locations on the dikes and CDF interior, including one successful brown pelican (BP) nest, the first BP nesting in Alabama in this century. By 1984, eight BP nests were active, and an estimated 16,000 birds of ten colonial species were nesting at 21 CDF locations (12,500 were gulls). By 1985, 133 BP nests are already built and active, and in excess of 16,000 birds of the same ten species are nesting. Hundreds of non-breeding white and brown pelicans are living at the CDF year-round, and the CDF receives considerable migratory and overwintering use by shorebirds, waterbirds, and waterfowl. The CDF is posted and has no predators. We will discuss data, design and management, and expected waterbird use as the CDF develops.

RELATION OF BREEDING PERFORMANCE IN KITTIWAKES TO OCEANOGRAPHIC AND METEOROLOGIC CONDITIONS IN THE SOUTHEASTERN BERING SEA

Lloyd, Denby S. (Institute of Marine Science, Univ. of Alaska, Fairbanks, AK 99701)

Several hypotheses concerning breeding performance in kittiwakes at an oceanic colony (St. George Island-Pribilofs) versus a coastal colony (Cape Peirce) have been tested using data available for 1970-84. Annual productivity of black-legged kittiwakes at St. George is not more constant than at Cape Peirce, and is not less constant than productivity of red-legged kittiwakes at St. George. Annual productivity of neither species at St. George is significantly correlated to mean date of hatching, but both show significant correlation with various measures of sea surface temperature, wind speed, precipitation, and heating degree days, as well as time. Data for black-legged kittiwakes at Cape Peirce, however, do not support similar correlations. These relationships are substantially different than those for more northern colonies in Alaska. A combination of trophic interactions and the effects of wind speed on foraging efficiency may account for variable productivity on St. George, but no reliable explanation is available for Cape Peirce.

THE BREEDING BIOLOGY OF HERRING GULLS AND GREAT BLACK-BACKED GULLS ON SABLE ISLAND, NOVA SCOTIA

Lock, Anthony R. (Canadian Wildlife Service, B.I.O., P. O. Box 1006, Dartmouth Nova Scotia, Canada B2Y 4A2)

Sable Island is a sand bar 150 km east of Nova Scotia, and it was chosen for this study because gulls breeding there do so in the absence of any food supplement from human activities. Although Great Black-backed Gulls bred more successfully than Herring Gulls, the breeding success of both species was extremely low. The food demand of chicks at all stages of growth was determined, and a food budget for the breeding season was constructed. The time adults spent

foraging was related to the food demands of broods, including enlarged broods. The differing abilities of these species to gather food for chick rearing was correlated with observed differences in breeding success. The ratio of early to late chick mortality was lower than usual, and an examination of eight other studies (*L. glaucescens, L. fuscus,* and *L. argentatus*) showed that this ratio is significantly and positively correlated with reproductive success. The effect of investigator's presence on reproductive success was also examined.

THE MOULT AND MIGRATION OF 'PORTLANDICA' TERNS

Lock, Anthony R. (Canadian Wildlife Service, B.I.O., P. O. Box 1006, Dartmouth Nova Scotia, Canada B2Y 4A2)

'Portlandica' terns are immature Arctic Terns which appear at the colony during the breeding season. Prior to about 1970, only a few 'portlandicas' per thousand breeding birds had been recorded but, since that time, their numbers have increased greatly, often amounting to a third or more of the birds present at colonies. 'Portlandicas' were captured in rocket nets on Sable Island, Nova Scotia, in mid-July and mid-August 1985. They did not differ from adults in weight but had significantly shorter wing lengths. After arrival at colonies, they underwent a complete tail moult and began a moult of primaries which may have gone as far as p6 by the time the birds left the colony to begin their southern migration. Adult Arctic Terns captured in August showed no sign of a comparable primary moult. Both adult and immature Arctic Terns are known to undergo a rapid moult of flight feathers in the southern hemisphere, and previous records of 'portlandicas' captured on the breeding range show that no primary moult was occurring. Several hypotheses are examined to explain the observed increase in numbers of 'portlandicas' and their aberrant moult.

AGE-RELATED ABUNDANCE AND FEEDING BEHAVIORS OF BONAPARTE'S GULLS *LARUS PHILADEPHIA* IN FREDERICK SOUND' SOUTHEAST ALASKA, 1980-84

MacIvor, Laurie H. (University of Massachusetts, Dept. of Forestry and Wildlife Management), and Virginia A. Rosenberg (2126 Arnold St., Portland, OR 97219)

Bonaparte's Gulls arrive in Frederick Sound, Alaska late-April to mid-May; however, numbers peak to 8,000-12,000 during late summer. Seasonal movements are age-dependent. Observed age-ratios of adult to juvenile gulls are higher in May and June. An influx of juveniles in late July coincides with peak counts and results in an age-ratio skewed towards young birds. Adults with breeding and non-breeding plumage are present throughout the summer. Post-nuptial molt occurs June-September. Nesting has not been documented in the study area although juveniles are infrequently observed in late April. Bonaparte's Gulls feed on four major prey using four prey-dependent feeding methods: head-dunking and flight-lunging (for fish), bill-dipping (for crab larvae and copepods), and flycatching (for swarming ants). Adults have higher feeding success rates than juveniles. Foraging seems tidally influenced, occurring principally during slack tidal periods along the perimeter of and within nearshore kelp beds, partially explaining the patchiness of gull feeding activities.

NEST SITE SELECTION IN CALIFORNIA GULLS

Mahoney, Sheila A. (Dept. of Biological Sciences, Florida Atlantic Univ., Boca Raton, FL 33431), and Joseph R. Jehl, Jr. (Hubbs Marine Research Institute, 1700 South Shores Road, San Diego, CA 92109)

California Gulls breed in areas where daily environmental temperatures may range from below freezing to more than 50°C. We found that nests at Mono Lake, California, were typically placed in open, rugose areas, which were somewhat cooler than other potential open sites that additionally offered shade provided by vegetation. These latter areas were avoided. We infer that rugosity provides safe hiding places for small chicks to escape cannibalism by adult gulls, while still being open enough to promote early detection of predators. Thermal conditions per se, although occasionally extreme, appear to be of secondary importance in the selection of nesting areas at Mono Lake.

RECENT CHANGES IN THE STATUS AND DISTRIBUTION OF DOUBLE-CRESTED CORMORANTS NESTING IN WISCONSIN 1973-85

Matteson, Sumner W. (Wisconsin Dept. of Natural Resources, Bureau of Endangered Resources, Box 7921, Madison, WI 53707)

From the early 1920's to the mid-1950's, nesting Double-crested Cormorants occupied a total of 17 known colony sites in 16 counties, though apparently no more than 7 colony sites were occupied during a single breeding season. The total number of nesting pairs statewide reached at least several hundred in peak years. Between the mid-1950's and early 1970's, habitat loss and deterioration, human disturbance, and pesticide contamination combined to threaten the species with extirpation from the state. The Double-crested Cormorant was listed as a state endangered species in 1972. In 1973, only 66 known nesting pairs occupied four colony sites. During 1973-85, the nesting population increased dramatically to over 2,000 pairs at 19 colony sites in 12 counties. Factors influencing population increases and distribution are discussed.

STATUS OF COMMON TERNS IN WISCONSIN 1979-85

Matteson, Sumner W. (Wisconsin Dept. of Natural Resources, Bureau of Endangered Resources, Box 7921, Madison, WI 53707), and Fred C. Strand (Wisconsin Dept. of Natural Resources, Ranger Station, Hwy. 2, Box 125, Brule, WI 54820)

Statewide, the number of Common Tern nesting pairs increased from 110 at three colony sites to 518-618 at six sites during 1979-85. The state's two largest colonies in 1985 were in Chequamegon Bay (Ashland Pier, 163 pairs) and in Green Bay (Kidney Island, 300-400 pairs). At the Ashland Pier, nesting pairs increased over 300% during 1979-85, largely due to control of vegetative growth and Ring-billed Gull nesting attempts. Production for four of seven years ranged from .79 to 1.44 young per pair at the Ashland Pier. Major factors limiting nesting success at Wisconsin colony sites are discussed.

DISTRIBUTION AND ABUNDANCE OF FORAGING WADING BIRDS AT A CENTRAL CALIFORNIA ESTUARY

McCrimmon, Donald A., Jr., and Helen M. Pratt (Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, CA 94970)

Bolinas Lagoon is a 570-ha estuary at the southern edge of the Point Reyes Peninsula on the central California coast. It is highly tidal and features mudflats, tidal creeks, salt marsh, and low islands as habitat. The Lagoon is a major foraging locus for large numbers of wading birds, including herons and egrets nesting at nearby Audubon Canyon Ranch. From March-August 1985, volunteers conducted 62 censuses totaling more than 110 hours of observation to assess foraging wading bird distribution in relation to breeding season, habitat, and tide. Use of the Lagoon peaked in June and July. Great Blue Herons made most use of open water and tidal channels. Great Egrets also made extensive use of shallow open water and tidal channels but were found in larger feeding aggregations. Snowy Egrets made relatively greater use of shallows near shore and mudflats. Black-crowned Night Herons were infrequent daytime foragers found most often on mudflats and *Ulva* mats. All species were most abundant during low tides.

FOODS AND FEEDING RATES IN A SMALL COLONY OF CANNIBALISTIC HERRING GULLS

McNicholl, Martin K. (Long Point Bird Observatory, Box 160, Port Rowan, Ontario, Canada N0E 1M0), John Struger, and D. Vaughn Weseloh (Canadian Wildlife Service, Canada Centre for Inland Waters, Box 5050, Burlington, Ontario, Canada L7R 4A6)

Observations of individual nests in 1983 at a colony of Herring Gulls (*Larus argentatus*) on Agawa Rock, Lake Superior, Ontario, showed low feeding rates at most nests, with prolonged periods of no feedings. Several adults were cannibals. Besides young Herring Gulls, food brought to nests included garbage, invertebrates, fish, frogs, salamanders, snakes, and other birds. The proportion of invertebrates and small birds was greater in comparison with fish than at most colonies documented in the literature. Some adults foraged actively on small insects in the vicinity of the nest. Birds were generally of warbler size, the largest being a female Red-winged Blackbird caught over the water.

SEX RATION AND EGG SEQUENCE IN RING-BILLED GULLS

Meathrel, Catherine E., and John P. Ryder (Dept. of Biology, Lakehead Univ., Thunder Bay, Ontario, Canada P7B 5E1)

Nesting Ring-billed Gulls (*Larus delawarensis*) were studied on Granite Island, northern Lake Superior, during the breeding seasons of 1978 to 1984 to determine if there was a relationship between female body condition and egg size, sex, and sequence. In years of limited pre-breeding food abundance, female body condition was depressed. These females laid fewer, lower quality eggs which hatched significantly more females. Both egg quality and female body condition deteriorated through the laying sequence. There was no difference in hatch weights within clutches. Male and female eggs did not differ in size or weight. Overall, there was a relationship between chick sex and egg sequence. The overall secondary sex ratio did not differ from unity, and the ratio of unisexual to bisexual three-egg clutches did not differ from 1:2:1. These results suggest that sex determination in this species occurs via random segregation of chromosomes.

THE IMPACT OF OILFIELD FACILITY DENSITY ON SHOREBIRDS, PRUDHOE BAY, ALASKA

Meehan, Rosa (INSTARR, University of Colorado, Boulder, CO 80309-450)

Shorebird densities were measured in the Prudhoe Bay Oilfield, located in wetlands of the Alaskan North Slope, to determine if impacts beyond those due to direct habitat loss and/or change occur. Impacts on breeding birds may be due to three levels of effects: (1) direct habitat loss due to gravel cover, (2) alteration of adjacent wetlands by gravel construction and facilities, and (3) indirect effects due to subtle, cumulative effects of multiple facilities. The oilfield development consists of numerous widely spaced facilities connected by a network of roads. Current estimates of the effects on breeding birds have focused on the first two levels, assuming that the blocks of tundra between the roads and facilities was not disturbed. I tested this latter assumption by comparing shorebird density estimates within the blocks with density estimates based on habitat availability and relating this to a measure of oilfield facility density. Shorebird densities decrease with increasing density of oilfield development, i.e., are lowest where facilities are close together. The effect of increased facility density may be due to subtle impacts associated with a single facility that intensify as the distance between facilities decreases. The results of this study demonstrate an indirect effect of large-scale development in the wetlands of the Alaskan North Slope that extends beyond direct habitat loss due to facility placement. This effect may be minimized by consolidating oilfield facilities and minimizing human activity and disturbance.

PARENT-CHICK BEHAVIORAL RELATIONSHIPS ON *FREGATA MAGNIFICENS*, IN SANTA MARGARITA ISLAND, B.C.S. MEXICO

Morena, L. A. R. Carmona, and J. Guzmán (Departamento de Biología Marina, Universidad Autónoma de Baja California Sur, Apdo. #219, B.C.S., México

From June to November 1985, the parent-chick behavioral relationships of *Fregata magnificens* have been studied. This work is being carried out on a reproductive colony located at Santa Margarita Island, B.C.S. (Lat 24° 30′ N, Long. 111° 50′ W). Twelve nests were selected for this purpose and observed for periods of 12 hours from a tower (6.5 m high). The nests were observed sequentially for periods of five minutes each during the observations. There is a total of 192 hrs. of observation. The behavioral patterns selected were: incubation, male-female interaction, feeding intervals, begging patterns, thermoregulation, nest defense, preening, and flight trials. This project has been planned to have a duration of one year.

TIME PARTITIONING OF CLUTCH AND BROOD CARE ACTIVITIES IN HERRING GULLS

Morris, Ralph D. (Dept. of Biological Sciences, Brock Univ., St. Catharines, Ontario, Canada L2S 3A1)

Color-banded Herring Gull adults were observed during three breeding seasons at a colony near Port Colborne, Ontario. Parents that successfully raised two or more chicks were normally both present with the clutch during incubation (one incubating, one standing). In most of these pairs, the timing of incubation was partitioned such that one parent incubated most frequently in the mornings, whereas the other normally incubated in the evenings. Partitioning of parental care activities continued throughout the chick-care period. In less successful pairs, both members were rarely present together, and one parent (either sex) did most of the incubating. Clutches (and broods) were frequently unattended. Thus, successful parents partitioned incubation and

proportion of knock-downs per night was higher at occupied burrows than unoccupied and lowest at artificial sites. For all classes, knock-downs were most frequent during the egglaying period, and the frequency declined during incubation. At occupied burrows, a second peak in knock-downs occurred during the hatching period, associated with an increase in changeovers by marked pairs. After fledging, few burrows were entered, despite large numbers of arrivals (many non-breeders) on some nights. The higher frequency of visits, shorter incubation stints, and larger eggs in 1985 suggest the presence of a more abundant food supply.

VIRGIN ISLANDS SHOREBIRD SURVEY

Norton, Robert L. (Div. Fish and Wildlife, 101 Estate Nazareth, St. Thomas USVI 00820), Fred W. Sladen, and John A. Yntema (Div. Fish and Wildlife, P.O. Box 1878, Fredriksted, St. Croix, USVI 00840)

Shorebirds are a conspicuous seasonal element of the avifauna observed in the Virgin Islands. Although recent literature since 1940 indicated the presence of shorebirds, no study of the group as a whole has been done. This paper discusses relative abundance, behavior, habitat selection, and periodicity of 24 species on three major U.S. Virgin Islands from January to December 1982. Habitat types surveyed include natural ponds of low salinity, severely altered mangrove lagoons and sandy coastlines. Scolopacidae were the most common migrants to use Virgin Islands Habitats, particularly the Calidridini tribe. Shorebird activity was assessed as resting (29%), feeding (63%), and other (12%). Although the greatest number of shorebirds was counted during March and October, many species were noted to remain through the tropical summer.

CLIMATIC INFLUENCES ON SEABIRD POPULATIONS OF THE TROPICAL WESTERN ATLANTIC

Norton, Robert L. (Div. Fish and Wildlife, 101 Estate Nazareth, St. Thomas, USVI 00802)

Whereas climate can affect remote seabird populations, e.g., Christmas Island and Galapagos Islands, by limiting food resources, and Powell (1983) demonstrated that supplemental food provided fish-eating birds (Ardeidae) increased clutch size and chick weight, it has recently been observed that seabird populations of the Virgin Islands archipelago are affected by drought and major El Niño/Southern Oscillation (ENSO) episodes. Norton (1985) showed that a strong correlation was evident in Roseate Tern clutch size with regard to changes in rainfall at least six months prior to egg-laying. A subtle yet measurable impact on the marine resource has been detected in terms of percentage change of egg size and clutch size by local rainfall. Three piscivore were studied:a procellarid, sulids, and larids representing inshore and offshore feeding habits for distributional and seasonal differences. Rasmusson (1984) suggested that interpretation of climate anomalies should be linked to an annual cycle. It appears that annual seabird breeding cycles and local and regional rainfall are closely linked as well.

USE OF MAN-MADE WATER IMPOUNDMENTS AS NESTING SITES BY WOOD STORKS IN FLORIDA

Ogden, John C. (Ornithological Research Unit, National Audubon Society, 115 Indian Mound Trail, Tavernier, FL 33070)

Traditional habitats utilized as nesting sites by Wood Storks, *Mycteria americana*, in Florida have most often been cypress swamps in interior locations and mangrove swamps in south Florida

coastal regions. Since at least the 1950's, nesting colonies of Wood Storks have also been located in man-made impoundments, presumably due to regional declines in the number of natural, cypress swamps that are suitable as nesting sites. Use of impoundments for nesting has increased from approximately 10% of regional stork populations in the late 1950's to between 40% and 78% in the years between 1975 and 1985. The differences in use between years correlates with annual differences in surface water conditions in natural sites. Nesting success in impoundments may be comparable to that in interior, natural sites in the same years, although an impoundment site is generally used by storks for only a few years due to vegetation deterioration.

ORGANOCHLORINES AND MERCURY IN CALIFORNIA COASTAL TERNS AND HERONS

Ohlendorf, Harry M. (Patuxent Wildlife Research Center (PWRC), Pacific Coast Field Station, c/o WFB, Univ. of California, Davis, CA 95616), Thomas W. Custer (PWRC, Gulf Coast Field Station, Victoria, TX), Roy W. Lowe (S.F. Bay NWR, P. O. Box 524, Newark, CA 94560), and Eugene Cromartie (PWRC, Laurel, MD 20708)

Organochlorines and mercury have caused adverse effects on fish-eating birds in certain regions. To assess the status of terns and herons of the California coast in relation to these contaminants, we collected eggs for chemical analysis and studied reproductive success in selected colonies. In San Francisco Bay, there were species differences for concentrations of DDE, PCB's, and mercury among the four species sampled (Caspian Tern, Forster's Tern, Black-crowned Night-Heron, and Snowy Egret). Among the three colonies where Caspian Tern eggs were collected (San Francisco Bay, San Diego Bay, and Elkhorn Slough), there were significant differences for concentrations of PCB's but not other organochlorines. In Black-crowned Night-Heron, there were significant correlations between DDE concentration and eggshell thickness.

BREEDING OF LEAST TERN IN THE ENSENADA DE LA PAZ, B.C.S. MEXICO

Palacios, E., and J. Guzmán (Departamento de Biología Marina, Universidad Autónoma de Baja California Sur, Apdo. #219, La Paz, B.C.S. México)

More than 112 pairs of Least Tern (*Sterna antillarum*) nested on a sandbar located in the Ensenada de La Paz (Lat. 24° 08' N, Long. 110° 23' W) in the summer of 1985. The colony was discovered on June 13 when breeding was well advanced and chicks were already present. In this work, we deal with aspects of the feeding of large chicks. We also report on late egglaying that took place between June and July; nevertheless, none of these clutches were successful.

This is the first report of a successful breeding season for this endangered species in the Ensenada de La Paz. In 1984, about 10 pairs of Least Tern nested in a different area of the Ensenada de La Paz but, due to high tides, the nests were all destroyed (Amador, et al., in prep.). We hope to continue our studies in the future.

THE USE OF DREDGED MATERIAL ISLANDS BY BIRDS IN NORTH CAROLINA

Parnell, James F. (Dept. of Biological Sciences, Univ. of North Carolina at Wilmington, Wilmington, NC 28403)

Dredged material islands have been recognized since the mid-1970's as important nesting sites for many species of colonial waterbirds. A series of studies has been conducted in North

Carolina that demonstrates a very high dependence on such man-made sites by most of the 22 species of colonial waterbirds that breed in the state. We have also found that dredged material islands are used by many other birds in a variety of ways including nesting by waterfowl, shorebirds, and songbirds and as important feeding sites for migrating shorebirds. Shorebird use has been found to be especially heavy on diked sites during the period of settling that follows dredged material deposition. This paper summarizes the use of dredged material islands by birds in North Carolina.

SEASONAL DISTRIBUTION OF FORAGING GULLS AT FLORIDA LANDFILLS

Patton, Stephen R. (Biology, Univ. of South Florida, Tampa, FL 33620)

The spatial distribution of foraging Laughing Gulls (*Larus atricilla*) and migrant Herring and Ring-billed gulls (*L. argentatus, L. delawarensis*) was studied at two landfills near Tampa Bay during 1981-82. I determined the distribution of gulls on the active dumping face by dividing the surface into seven regions, observed in the presence and absence of bulldozers. Randomly selected gulls were followed to their landing locations and the species and age-classes of their 10 nearest neighbors were recorded. Log-linear analyses were used to test for random distributions of gulls among species, age-classes, locations, and bulldozer activities. Interactions between species and age, species and bulldozer, species and location, and age and bulldozer were significant for fall, winter, and spring seasons; in summer, only age-related interactions were significant. Consistent positive associations of adult Laughing Gulls with bulldozers, Herring Gulls with the top edge of the face, and Laughing Gulls with the bottom edge of the face were observed; other distributional patterns changed seasonally. Species differences in feeding method, morphology, and behavior contribute to observed distributional patterns.

BEHAVIORAL CONSEQUENCES OF HABITAT SELECTION IN THE HERRING GULL

Pierotti, Raymond (Dept. of Zoology, Univ. of California, Berkeley 94720)

Data were collected on time budgets, rates of aggressive behavior, and diet were studied during two seasons in three habitats on Great Island, Newfoundland. Exposed marine terraces (rocky) had the highest nest density, and territories were subject to high levels of intrusion by conspecifics. Birds in this habitat spent most of their time present defending the territory, showed high levels of aggression, and fed primarily in the adjacent intertidal. Gulls nesting in meadow habitat suffered high levels of egg and chick predation from Great Black-backed Gulls. As a consequence, these birds also spent most of their time present on their territories and had very high levels of aggression. These birds fed predominantly on Leach's Storm Petrels, which they could capture without leaving their territories. Gulls nesting on grassy slopes had the lowest nest density, the largest territories, low rates of aggression, and foraged predominantly away from the colony, often on garbage dumps. Constraints imposed by intruders in rocky habitat, and by predators in meadow habitat, forced adults to show high levels of attentiveness, which in turn constrained their foraging tactics. In contrast, the lack of external constraints in grassy slopes allowed foraging far from the colony.

THE COST OF REPRODUCTION AND THE EVOLUTION OF CLUTCH SIZE IN GULLS

Reid, Walter V. (Dept. of Zoology NJ-15, Univ. of Washington, Seattle, WA 98195)

One of the selective factors that may play a role in the determination of the clutch size of gulls is the cost of reproduction. If there is a trade-off between the allocation of resources to

current reproduction and the ability of an organism to reproduce in future years, then selection could result in clutch sizes smaller than those which show the highest productivity. I examined the cost of reproduction in Glaucous-winged Gulls (*Larus glaucescens*) on Protection Island, Washington between 1983 and 1985. For two successive years, I manipulated the clutch sizes of 300 to 400 color-banded adult gulls and then measured the survival and fecundity of these gulls in the following years. In this paper, I discuss the importance of this long-term cost as it affects the optimization of clutch size relative to other factors limiting fecundity.

SEASONAL VARIATION AND FOOD HABITS OF THE SCOLOPACIDAE PRESENT IN THE ENSENADA OF LA PAZ AND SANTA MARGARITA ISLAND, B.C.S., MEXICO

Rico, C, and J. Guzmán (Departamento de Biología Marina, Universidad Autónoma de Baja California Sur, Apartado Postal No. 219, La Paz, B.C.S., México)

Among the animal populations interacting in intertidal habitats are the shorebirds. Due to their numbers and high metabolic rates are of great importance in the energy flow of these ecosystems. In some species, it has been estimated that they can consume an amount of food equivalent to 55% of their body weight daily. In the present work, we deal with diversity, abundance, and seasonal variation of shorebirds of the family Scolopacidae present in the study area. The food habits of these species, whose populations exceed 50 individuals in each site, are also described. We attempt to estimate the energy requirements based on data obtained from the specimen collected.

HABITAT SUITABILITY INDEX MODELS FOR WETLAND BIRD GUILDS

Roberts, R. Chad (Oscar Larson and Assoc., P.O. Box 3806, Eureka, CA 95501)

Habitat suitability index (HSI) models for wetland bird guilds (as defined by Root 1967) were developed as part of a wetland mitigation bank design program for the Humboldt Bay area in northern California. Bird guilds using the study area were identified, and habitat preference factors were identified from local observations and the literature for species in five guilds. The guilds are: (1) wintering shorebirds, (2) breeding waterfowl, (3) egrets, (4) freshwater rails, and (5) riparian songbirds. Composite suitability index graphs were developed for factors affecting the group of species in each guild. Rated suitability factors were combined into HSI models, using USFWS modelling software for personal computers. The structures of the models and preliminary results of applications will be presented. The results indicate that it is feasible to model habitat suitability for wetland bird guilds, based on ecological preferenda of member species. Such guild models should be restricted in focus to ecologically similar species in order to be useful. Models that present suitability as a proportion of the guilds potentially present in an area appear to be less useful.

SOURCES OF SEX RATIO BIAS IN THE BREEDING POPULATION OF WESTERN GULLS ON SANTA BARBARA ISLAND

Sayce, James, and George Hunt (Dept. of Ecology and Evolutionary Biology, Univ. of California, Irvine, CA 92717)

Recent work has shown the adult breeding population of Western Gulls (*Larus occidentalis*) on Santa Barbara Island has a sex ratio of 0.67 males per female. We investigated sources of this bias by estimating the sex ratio of Western Gull chicks at hatching (1.12 M/F, n = 609) and at fledging (0.89 M/F, n = 189). Neither value differs significantly from 1.0, although the shift

in bias toward females suggests the possibility of excess male mortality prior to fledging. Preliminary results from studies of individually color-banded, known-sex chicks indicate greater male mortality post fledging.

TURNOVER RATES IN A DECLINING COMMON TERN POPULATION

Scharf, William C. (Dept. of Biology, Northwestern Michigan College, Traverse City, MI 49684)

I have calculated turnover rates (Erwin 1977) for Common Terns (*Sterna hirundo*) from the Michigan Great Lakes for a period of 25 years. Included in these population data are the 3 years of Ludwig's surveys (1962) and 10 years of my own (conducted with G. W. Shugart and others) surveys from 1976-85. The resulting analysis emphasizes the importance of the dwindling number of alternate sites as rising water levels, human and animal disturbance, and vegetative succession render the preferred sites uninhabitable. Early trends show moderate to high turnover rates. At this point, the population sought new sites with some success, even though many were only marginally suitable. The number of colonies then began to decrease from 26 to the present 16. It is not surprising that turnover rates in this declining mode are low. There is just nowhere else to breed. Low turnover rates, therefore, do not necessarily indicate stability in a population. I suggest that an index calculated using colony size as a factor will more accurately portray the gravity of the situation described here.

SEASONAL CHANGES IN THE DENSITY AND AGE-COMPOSITION OF HERRING GULLS IN THE CONTINENTAL SHELF WATERS OF THE NORTHWEST ATLANTIC

Selzer, Lawrence A. (Manomet Bird Observatory, Manomet, MA 02345)

Sighting records collected between Cape Sable, Nova Scotia, and Cape Hatteras, North Carolina, 1978-80, were used to compare the seasonal densities and age-composition of Herring Gulls *Larus argentatus* on the continental shelf of the northeastern United States. The seasonal pattern of abundance of Herring Gulls was one of increasing density through mid-February, followed by a rapid decrease after mid-March; however, the increases were most apparent in different regions according to season. In both summer and fall, adults and immatures were represented approximately evenly in the survey area, while in winter ($P < 0.05$) and again in spring ($P < 0.05$), adults were significantly more abundant than immatures. This unequal age-distribution was most pronounced at the edge of the continental shelf of the Mid-Atlantic Bight where, in winter and spring, more than 81% of the birds recorded were adults. These seasonal fluctuations were largely affected by the immigration of adults to offshore feeding zones along the shelf edge of the Mid-Atlantic Bight in late fall where food availability (offal) is seasonally increased.

NEIGHBOR INTERACTIONS AND COOPERATION AMONG BREEDING HERRING GULLS: AN ALTERNATIVE INTERPRETATION OF GULL TERRITORIALITY

Shugart, Gary W. (Dept. of Psychology NI-25, Univ. of Washington, Seattle, WA 98195), and Mary A. Fitch (5230 16-NE, Seattle, WA 98105)

Theoretical studies predict that cooperation may evolve when individuals interact repeatedly and when costs and benefits to pairs of interactants are equivalent. These conditions apply to neighbors in territorial birds. One might expect neighboring gulls to be uncooperative because of the relatively high rate of chick killing by neighbors that has been reported in the literature. This mortality results from movement of chicks from parents' territories. Chick movement is a form of

defection in a stable aggressive system based on site fixity and site-specific dominance. In previous studies of aggression in gulls, chick mortality probably has been exaggerated because of defections induced by human disturbance. A test of the above prediction regarding cooperation among gulls requires an examination of neighbor interactions in the absence of disturbance. In four years of study, we found that (1) mortality due to neighbors is rare in the absence of disturbance and (2) aggressive interactions between neighbors provides evidence for our hypothesis that cooperation between neighbors is an evolutionary force in coloniality.

ECOLOGICAL SEGREGATION AMONG THE BREEDING CORMORANTS OF PUERTO DESEADO, ARGENTINA

Siegel-Causey, Douglas (Museum of Natural History, Univ. Kansas, Lawrence, KS 66045)

Five species of cormorants breed in or near the mouth of Ria Deseado in southern Argentina. *P. gaimardi* nests only on steep rock faces and feeds on shoaling sprat. *P. magellanicus* nests on more open cliffs, and its diet is similar but distinguished by demersal crustaceans. *P. olivaceus* breeds exclusively on low shrubs and ranges widely in its search for bottom and mid-water fish. *P. atriceps* and *P. albiventer* have very similar diet and breeding preferences; habitat preference and behavior accounted for most of the foraging differences. Past biogeographic events have allowed these five species (and possibly two others) to range along Atlantic Patagonia; the unique geography of Puerto Deseado provided the appropriate habitat; an interaction of classical niche shifts and habitat segregation have enabled all five species to co-occur, a situation found nowhere else.

ARCHIVING SEABIRD PLOT DATA - THE ALASKAN PROGRAM

Sowls, A. L. (U.S. Fish and Wildlife Service, 1011 E. Tudor Road, Anchorage, AK 99503), and Myers, J. P. (Academy of Natural Sciences of Philadelphia, 19th and The Parkway, Philadelphia, PA 19103)

The Alaska seabird management project in cooperation with VIREO (Visual Resources for Ornithology program sponsored by the Academy of Natural Sciences) have set up a system to archive data and plot photographs related to seabird monitoring. Information is selected for inclusion by the Fish and Wildlife Service. Plot photographs usually consist of prints on which plot and counting locations have been delineated. Such prints are rephotographed for submission to VIREO in the form of slides. In addition to plot photographs, general photos of colonies are included when they might be useful for future comparisons. VIREO archives submissions using state-of-the-art archival methods with the goal of maintaining materials for hundreds of years. The Fish and Wildlife Service maintains files of data and plot photos in the Anchorage office for field use. Duplicates of slides or prints are available from VIREO at cost. The Fish and Wildlife Service welcome any submissions of appropriate Alaskan materials or suggestions for improvements of archival procedures.

EFFECTS OF INCREASED POPULATION SIZE IN HERRING GULLS ON BREEDING SUCCESS AND OTHER PARAMETERS

Spaans, Arie L., Marianne A. van Vlaardingen, and Alle A. N. de Wit (Research Institute for Nature Management, P.O. Box 9201, 6800 HB Arnhem, Netherlands)

In the Netherlands, the numbers of the Herring Gull (*Larus argentatus*) have increased from 17,000 pairs in 1968 to 90,000 pairs in 1984. In 1983-84, we studied the effects of increased

numbers on breeding success and other parameters on the island of Terschelling. In our six-ha study plot, the total number of gulls tripled since the late 1960's, and breeding success decreased from 1.25-1.50 to 0.34-0.43 fledged young per pair. The lower success can be ascribed to increased predation by gulls as a result of the larger number of gulls. Since 1969, egg size has decreased by up to 4.2% in the c-eggs in 1983. Also, chicks became smaller, grew less fast, and reached a lower weight at fledging than before. At present, it is almost exclusively the young from eggs of early, experienced breeders that reach maturity. In 1983-84, the mean date on which the first egg was found in each nest was four to nine days earlier than in the late 1960's.

SURVIVAL AND MORTALITY IN WESTERN GULLS

Spear, Laurence B., David G. Ainley, Teresa L. McElroy, and Jay F. Penniman (Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, CA 94970)

During 1978-85, we studied survival and mortality in a large, stable colony of Western Gulls (*Larus occidentalis*) breeding on Southeast Farallon Island, California. We monitored breeding adults returning to the colony during 408 "gull years," and autopsied 1,613 dead Western Gulls of all ages on Southeast Farallon Island and along the California coast from Monterey to the northern border. Annual survival rates of breeding adults was 0.83 ± 0.03 (n = 7 years) and varied little among sexes and age classes, including 3-17 year old birds. Estimated survival rates were 0.48, 0.75, and 0.81 among first-, second-, and third-year birds, respectively. Sex ratios of young at hatch (n = 99 collected), and of young dying prior to dispersal, were near unity; however, that of post-dispersing young dying during their first year was 1.21 males per female because of a higher rate of starvation in males. First-year males, which attain body sizes larger than females and, therefore, have higher energy demands, apparently have higher mortality where food is limiting. Sex-related mortality, inclusive of subadults, indicated a sex ratio of 0.71 males per female in the fourth year.

ANNUAL SURVIVORSHIP OF ROSEATE TERNS BREEDING IN CONNECTICUT: MANAGEMENT IMPLICATIONS FOR A PROPOSED ENDANGERED SPECIES

Spendelow, Jeffrey A. (Little Harbor Laboratory, Inc., 69 Andrews Road, Guilford, CT 06437)

Several analyses of the capture-recapture data on 745 adult Roseate Terns (*Sterna dougallii*) caught from 1978-1985 on Falkner Island, Connecticut, suggest that the average annual survival rate, "S," for this species is about 0.70, or that roughly 30% of the breeding population is lost each year due to death and/or emigration to other colonies. Estimates of breeding population size generated by the standard Jolly-Seber model for open populations average about 50% greater than those generated from nest count data over the same six-year period, 1979-84. Along with observed annual fluctuations in colony size, this suggests that either a large number of birds may not breed in a given year, or that they breed elsewhere, thereby implying a substantial amount of intercolony movement from year to year. Survival rates may vary significantly from year to year, but if survivorship is assumed to be constant, then calculations of average population loss vs. recruitment rates suggest that the breeding population has declined at the rate of about 12 birds per year, despite the apparent gain shown by the nest count data.

MATE FIDELITY, SITE TENACITY AND SEX DIMORPHIC TRAITS IN BLACK TERNS

Stern, Mark A., Robert L. Jarvis, and Richard Del Caro (Dept. Fisheries and Wildlife, Oregon State Univ., Corvallis, OR 97331)

Few black terns maintained pair bonds between years. There were no instances of mate swapping, and lack of mate fidelity may be best explained by either low survivorship and/or dispersal to other breeding areas. Approximately 67% of the recaptured terns were nesting within the same primary nesting area (PNA), often at the same colony site. Distribution of the remaining 33% of the recaptures was characterized by random dispersal to other PNA's. Within mated pairs, males were always larger than females (skull + culmen, culmen) and, overall, males were more likely to be the first caught of a given pair in the nest trap. Nest success and fledging rates did not differ among habitats of varying vegetative composition and water depth.

BIOLOGICAL AND HUMAN BIASES IN THE CENSUS OF LEAST TERNS

Thompson, Bruce C. (Texas Parks and Wildlife Dept., 4200 Smith School Road, Austin, TX 78744), and R. Douglas Slack (Dept. of Wildlife and Fisheries Sciences, Texas A & M Univ., College Station, TX 77843)

Observer coverage, count accuracy, and chronology of least tern (*Sterna antillarum*) presence at colonies were studied during the 1979-81 breeding seasons in coastal Texas and compared to historic census efforts. Surveys were adequately timed and counts at visited colonies correlated well with tern presence. Previous surveys disproportionately sampled nesting areas used, emphasizing those with numerous nesting species and previous nesting history. Multipliers for estimating breeding pairs from total counts of terns at colonies during the survey period were evaluated and improved. Downward trends of least terns in the 1970's were largely explained by aspects of observer coverage and habitat changes. Established survey procedures are not consistent with the disassociative nesting habits and ephemeral site use displayed by least terns.

A COMPARISON OF SOME ADAPTATIONS OF HERRING AND RING-BILLED GULL CHICKS TO THEIR NATAL ENVIRONMENT

Uin, Linda M. (Dept. of Zoology, Univ. of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2)

I studied aspects of the behavior of chicks of ground-nesting Herring Gulls (*Larus argentatus*) and Ring-billed Gulls (*L. delawarensis*) in the interlake region of Manitoba in 1981 and 1982 to identify possible adaptations of the chicks to their natal environment. Results obtained from both colony- and laboratory-reared chicks suggest that the characteristic mobility pattern exhibited by chicks of each species represents an important adaptation to the chick's particular natal environment. The tendency for Ring-billed Gull chicks to remain sedentary in a cohesive family group at all locations, except to approach and follow their calling parents during movements away from the territory, may represent a strategy designed for areas with high nest densities. Conversely, the lack of parentally-induced wandering and the avoidance of hostile neighboring adults, young, and other rearing areas in Herring Gull chicks may represent an adaptation to low nest densities and high aggression levels characteristic of this species.

PREDATORY BEHAVIOR OF YELLOW-FOOTED GULLS TOWARDS HEERMANN'S GULL CHICKS AT DENSE AND SCATTERED NESTING SITES

Velarde, Enriqueta (Instituto de Biología, UNAM, Apartado Postal 70-153, 04510 México, D.F.)

Predation has been widely hypothesized as one of the factors having a major influence on group formation in birds. I studied the predatory behavior of Yellow-footed Gulls (*Larus livens*) towards Heermann's Gull (*L. heermanni*) chicks at dense and scattered nesting areas at Isla Rasa,

Baja California. Dense areas had a significantly greater search time and number of predation attempts, obtained more prey but at a lower proportion than the loose areas. Although Heermann's Gull chicks cannot be a major food item for Yellow-footed Gulls, this predator may influence the selection of dense nesting areas in the Heermann's gull. Topographic conditions may determine nesting density and set a limit to nest site availability for this species in islands of this area.

HABITAT SELECTION OF MEW GULLS ON VANCOUVER ISLAND: COMPARISON WITH GLAUCOUS-WINGED GULLS

Vermeer, Kees, and Kevin Devito (Canadian Wildlife Service, P. O. Box 340, Delta, B.C., Canada V4K 3Y3)

Mew Gulls nest on islands, tree stumps, pilings, and in trees on meso- and oligotrophic lakes on Vancouver Island. They nest most often solitarily, but up to four breeding pairs have been found on an island. Mew Gulls prefer to nest on lakes close to sea, at low altitude, and on those with many small, bare, and rocky islands. Match point analyses of nest sites on islands showed that nests were situated on a mossy and rocky substrate away from tall vegetation, and on island crests. Nesting islands averaged 290 m (5-1,650 m) and nesting pilings and stumps 36 m (5-400 m) from shore.

Although mostly solitary, breeding pairs from adjacent areas join and react to human intruders and predators with calls, dive-bombing, and distraction displays. Nest-site selection and anti-predator behavior in Mew Gulls on Vancouver Island is compared with that of Mew Gulls in Europe and other gull species.

SULIDAE EVOLUTION IN THE CALIFORNIA CURRENT AND THE ECOLOGICAL EFFECTS OF EXTINCTION

Warheit, Kenneth I. (Dept. of Paleontology, Univ. of California, Berkeley, CA 94720)

The ancient California Current is the only major cold water upwelling system without an indigenous sulid. This anomaly becomes even more of an enigma when one considers the fossil record. From the late Miocene (16 mya) to the Pleistocene, the Sulidae was a diverse and abundant group in this system. Understanding this diversity pattern and its causal processes is essential if California seabird communities are to be viewed from an evolutionary perspective. Two aspects of California sulid evolution are discussed: (1) differential diversity patterns of *Morus* and *Sula*, and (2) possible causes and the potential ecological effects of California sulid extinctions.

ARRIVAL AND DEPARTURE CHARACTERISTICS OF RING-BILLED GULLS FROM TERRESTRIAL FEEDING SITES

Welham, Clive V. J. (Dept. of Zoology, Univ. of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2)

Ring-billed gulls (*Larus delawarensis*) arriving and departing terrestrial feeding sites were shown to be grouped in time and space. Excluding large flights to the colony in the evening, frequency distributions of flock sizes were not significantly different for arrivals and departures suggesting a consistent, possibly optimal size range for group searching. Morning and mid-day departures suggested a consistent, possibly optimal size range for group searching. Morning and mid-day departures were not correlated with colony direction regardless of distance but were

significantly correlated with wind. Wind is postulated to play an important role in maintaining forager densities thereby permitting gulls to efficiently exploit patches far from the colony.

COMPARISON OF SHOREBIRD AND WATERFOWL USE ON RESTORED AND NATURAL INTERTIDAL WETLANDS (MUDFLATS) AT UPPER NEWPORT BAY, CALIFORNIA

Wilcox, Carl G. (California Dept. of Fish and Game, 245 W. Braodway, Long Beach, CA 90802)

As part of a combined wetlands restoration/sediment control project completed in November 1982, 35 acres of lower intertidal habitat were created in the Upper Newport Bay Ecological Reserve. Following completion of the project, the restored area was included in an ongoing shorebird and waterfowl censusing program at the Reserve. Censuses were conducted at low tide between November 1982 and March 1985. In the three years following the project, use of the restored area has increased gradually. Use by shorebirds differs seasonally from that observed in the remainder of the Upper Bay. Highest use was recorded in the late summer and early fall. During the third year, use appeared to be extending later into the year. After three years, shorebird use had not reached levels encountered on natural mudflats of similar size within the Upper Bay. Species utilization of the restored area is reviewed. Effects of the project on migratory and resident water-associated birds are described. Factors affecting use of the restoration area are discussed.

BLACK BRANT AND EELGRASS AT WILLAPA BAY, WASHINGTON

Wilson, Ulrich W. (U.S. Fish and Wildlife Service, Nisqually National Wildlife Refuge, 100 Brown Farm Road, Olympia, WA 98506)

Winter attendance of Black Brant and distribution of eelgrass *Zostera marina* were studied at Willapa Bay, Washington, between 1979 and 1985. Brant use at Willapa Bay sharply declined from 772,000 use days in 1980-81 to 412,000 use days in 1984-85. During the 1978-79 and 1979-80 seasons, there was no evidence that hunting pressure influenced brant use of the bay. Age ratio counts at Willapa Bay were consistently below those from other U.S. wintering areas. Between 1981 and 1984, the extent of eelgrass beds at Willapa Bay decreased by 22%. Less than one-fifth of this loss was clearly caused by expanding oysterbeds. At Willapa Bay, hunting-associated disturbance and damage of eelgrass beds by mariculture does not explain the rapid decline in brant use.

REGIONAL REPORTS

SOUTHERN CALIFORNIA, ZOE EPPLEY

California State University, Long Beach

Charlie Collins, Jon Atwood, Barbara Massey, Dennis Minsky, Kathy Kean, and others. Least Tern studies, including population surveys, age composition of colonies, nest site selection, return rates of adults and chick growth rates.

Barbara Massey and Dick Zembal. Population surveys of Light-footed Clapper Rails (1985 was a disasterous season with most populations down in numbers).

Stuart Warter. Continuing his study of the fossil anatid *Chendytes*.

Hubbs Sea-World Research Institute

Joe Jehl. Continuing monitoring of Mono Lake birds.

Los Angeles County Museum

Ralph and Betty Ann Schreiber. Reproductive ecology, diet and longevity of Christmas Island seabirds and aftereffects of El Nino.

Joe Williams (Pepperdine). Seabird energetics.

Larry Clark. Nest site microhabitat and consequences for population regulation.

Bob Pitman. Continuing to build museum collection of Pacific seabirds (specimens collected on EPOX cruise).

SeaWorld

Frank Todd. Aviculture of Antarctic seabirds (penguins, procellariformes, and gulls) and Alcids.

U.S. Fish and Wildlife Service

Monitoring of Brown Pelican population on Los Coronados Islands in collaboration with Dan Anderson.

University of California, Irvine

George Hunt, Dennis Heinemann, Dick Veit, and British Antarctic Survey. Pelagic distribution of Antarctic birds relative to krill distribution.

George Hunt, Nancy Harrison, and Zoe Eppley. Consequences of physical structure in the ocean for zooplankton distribution and auklet foraging near colonies in the northern Bering Sea.

Bryan Obst and Zoe Eppley. Energetic costs related to different foraging distributions.

George Hunt, Bryan Obst, Nancy Harrison, Ken Coyle, and Zoe Eppley. Spatial and temperal dynamics of whale slicks as feeding sites for seabirds.

Nancy Harrison. Distribution of surface-feeding and diving seabirds relative to vertical and horizontal scales of patchiness in the ocean.

University of California, Los Angeles

John Boland. Consequences of body size in resource partitioning among shorebirds and breeding and migration schedules.

Terry Bucher. Ventilation in penquin chicks and adults.

Judith Hand and Bryan Obst. Morphometrics of gulls.

Bryan Obst. Energetics of Antarctic seabirds.

Bernice Wenzel. Procellariiform olfaction.

CONSERVATION SECTION

- *PSG Conservation Committee*

Kees Vermeer has served as an excellent chair of the PSG Conservation Committee during the last three years. He felt that it was time for a change in personnel and resigned at the PSG business meeting at San Francisco, 7 December 1985. I have agreed to take on the responsibility as chair of the committee. I look forward to working for the PSG on conservation issues.

Current PSG policy with regard to conservation issues is stated in the PSG Bulletin (11[1]: 14-15). Briefly, the PSG position on noncontroversial, local issues should be developed by the respective regional Conservation Committee members and other PSG members without Conservation Committee Chair involvement. All draft letters or comments made by PSG as a group should then be sent to the PSG Chair for editing, final approval, and signature. For national, international, or particularly controversial issues, PSG positions or comments are to be coordinated by the Conservation Chair prior to transmittal to the PSG Chair for approval and signature.

As of 1984, the following people were listed in the PSG Bulletin as being responsible for conservation issues in their respective regions:

Mexico - Enriqueta Velarde
California - Dan Anderson
Oregon - Palmer Sekora
Washington - Eric Cummins
British Columbia - Kees Vermeer
Alaska - Barb Johnson
Hawaii - Stewart Fefer
Eastern U.S.A. - Ron Naveen

If any of the above members cannot or do not want to serve as the regional "conservation trouble shooter," they should inform me or suggest another PSG member who is willing to do the job. I will soon be contacting these people and other members who have expressed an interest in conservation issues.

Finally, as the new PSG Conservation Chair, I am looking forward to working with interested members to further PSG's involvement in coastal issues. I feel strongly that PSG should forcefully promote environmental protection in our area of professional expertise. To those PSG members on the Conservation Committee, I take your agreement to work on conservation issues as a license for me to badger you from time to time.

Jay W. Nelson
U.S. Fish and Wildlife Service, Wildlife Assistance
1011 E. Tudor Rd., Anchorage, AK 99503

- *Conservation Issues - Alaska*

Several members of the Pacific Seabird Group in Alaska recently met with the Conservation Committee Chair in Anchorage to discuss conservation issues relating to coastal Alaska and to provide the Chair with some thoughts on issues the Committee may want to address in the future. Items discussed included: 1) the advantages of producing a disturbance pamphlet for the general public (which could be sold by PSG to coastal wildlife refuges, Natural History Associations, and other outlets) rather than solely for researchers; 2) the necessity of members getting involved in regional conservation issues so PSG can respond and provide sound input; and 3) the growing necessity for continued input from seabird biologists and fisheries biologists on potential fisheries-seabird conflicts over prey species. The latter topic has been the subject of much discussion and some limited research by ornithologists in Alaska. The informal group of PSG members decided to meet on a more regular basis in order to keep abreast of conservation issues as well as to divide responsibility for reviewing development proposals, environmental impact statements, and the like. Other areas which contain pockets of PSG members interested in conservation issues may wish to consider a similar strategy.

Barb Johnson

- *Conservation Issues - Northern California*

A. T/V Puerto Rican oil spill: As widely reported in the media, the October 31, 1985 explosion and fire onboard the T/V Puerto Rican resulted in the eventual release of 1,470,000 gallons of petrochemicals when the vessel subsequently brok in half 17 km south of the Farallon Islands on November 3. The stern section sank at that site, taking approximately 357,000 gallons of bunker C to the bottom at a depth of 1,800 ft. In early April, the U.S. Coast Guard indicated that no salvage attempt would be possible. At present, the sunken stern still exudes a light sheen of oil with occasional globs of heavier material.

In March 1985, the Point Reyes Bird Observatory with assistance from International Bird Rescue issued a special report summarizing information gathered concerning the impacts on marine birds and mammals in the Gulf of the Farallons from this spill. Based on survey data, PRBO estimated that approximately 5,000 common murres and Cassin's auklets were killed or disabled from this incident. Approximately 700 dead birds were recovered from Marin and Sonoma County beaches and 624 oiled individuals treated at wildlife rehabilitation centers. The majority of birds were treated at Fort Cronkhite where, through the cooperative efforts of California Department of Fish and Game, U.S. Fish and Wildlife Service, and Bird Rescue, a full-scale temporary facility was established. Alcids (39.4%), scoters (31.6%), grebes (14.8%), and loons (7.7%) made up 93.4% of the combined totals of live and dead birds.

The sunken stern steadily leaking oil continues to pose a threat to breeding and nonbreeding marine birds and mammals in the Gulf of the Farallons. At present, birds fouled with oil traced from the stern of the Puerto Rican are being observed at the Farallons.

B. Seabird gillnet mortality: The incidental take of common murres by gill and trammel netters along the central California coast continues to generate concern among local conservation groups. Net mortality of murres in the Gulf of the Farallons during 1984 was lower (6-7,000) than in 1983 (28,000) which may be a reflection of the 63% decline in the Farallon breeding population from 88,000 in 1982 to 30,300 in 1984. At present, the Washington office of the USFWS is responding to an inquiry from several San Francisco Bay Area congressmembers as to the responsibilities of the Service under the Migratory Bird Treaty Act regarding this controversy.

C. Scoter die-off: During the week prior to the Puerto Rican oil spill, dead and dying white-winged and surf scoters began coming ashore in the Tomales and Bodega Bay regions. Reports were also received of scoters dying in Monterey Bay during the same period. At least 500 birds were known to be affected by this event. Nearly five months of investigation by the USFWS National Wildlife Health Lab revealed no definite causative agent except starvation. Tissue samples have been forwarded to the Patuxent Wildlife Research Center for contaminant analysis.

D. Selenium in bay scoters: During 1984, contaminant analyses were completed of surf scoters collected in south San Francisco Bay in 1982. This sampling was a cooperative effort of the USFWS and California Department of Fish and Game. The mean level of selenium found in livers was 34.4 ppm (which is comparable to concentrations among dabbling ducks at Kesterson NWR, where severe reproductive problems and mortality have been encountered). An additional 30 surf scoters have been collected during January-March 1985 from both the north and south bays and presently await analysis.

Tom Harvey

- *Oil Spills*

A. *Arco Anchorage* - Port Angeles, Washington oil spill: At about 16:45 hours on 21 December 1985, the oil tanker *Arco Anchorage* ran aground in the entrance to the Port Angeles harbor, located on the Strait of Juan de Fuca, Washington. The hull was ruptured, releasing about 189,000 gallons of Prudhoe Bay crude oil (less than 1% of the oil on board). Much of the oil was trapped in the harbor, but large amounts traveled east with lesser amounts coming ashore on the Dungeness NWR. Later, oil moved west and came ashore at a few locations. Oil movement was largely the result of tides and currents, as a low energy system persisted for the first two weeks, without appreciable winds.

In total, about 1,560 oiled alive birds were retrieved from beaches and taken to the bird-cleaning station. Fifty percent of the birds arrived within 48 hours of the spill, and 96% were accounted for by seven days. Another 360 oiled birds were found dead on beaches.

Thirty-seven species of waterbirds were found oiled. Of these, the Red-necked Grebe (*Podiceps grisegena*) alone accounted for 47% of the total numbers. Other species occurring in large numbers were Horned Grebe (*P. auritus*), Oldsquaw (*Clangula hyemalis*), White-winged Scoter (*Melanitta fusca*), and Pigeon Guillemot (*Cepphus columba*).

Of the oiled alive birds that were cleaned, about 280 were banded and released. Beaches were then systematically searched in the release area for any that died and were washed ashore. Thus far, only seven have been retrieved.

Aerial, boat, and ground surveys of the spill area bird populations were performed by T. Wahl. The data gathered were compared to baseline data for the area. The results of these surveys and other avian aspects of the spill are in preparation for publication.

Steven M. Speich

B. *Apex Houston* - San Francisco oil spill: On 1 February 1986, the barge *Apex Houston*, en route from San Francisco to Los Angeles, released about 30,000 gallons of crude oil between San Francisco and Monterey Bay. By 3 February, many live and dead oiled birds were coming ashore between Bodega Bay and Point Sur, as well as on the Farallon Islands. By 6 February, over 2,500 live oiled birds (mainly Common Murres and Western Grebes) had been received at cleaning centers. Beached bird counts indicated that as many dead oiled birds reached shore as live birds. The cleaning centers were swamped. Many of the birds that were released shortly after being cleaned returned to shore, mainly as a result of intense storms in mid-February. After the storms, hundreds more dead birds (mainly Rhinoceros Auklets) washed ashore, mainly between San Francisco and Bodega Bay.

Harry R. Carter and Gary W. Page
Point Reyes Bird Observatory

Planning Begins for Alaska Maritime National Wildlife Refuge

Public comments on the Alaska Maritime National Wildlife Refuge are being solicited by the U.S. Fish and Wildlife Service (FWS) planning staff through April 15, 1986. General information, site-specific knowledge, and information about issues related to the Alaska Maritime refuge are needed to help FWS staff develop a draft comprehensive management plan that would guide refuge management for the next 5-10 years.

The Alaska Maritime National Wildlife Refuge was established in 1980 by the Alaska National Interest Lands Conservation Act. It is comprised of more than 2,500 islands, islets, spires, rocks, and headlands agong the Alaskan coast. The refuge is a spectacular blend of tundra, rain forests, cliffs, volcanoes, beaches, lakes, and streams. It extends from the Arctic Ocean to southeast Alaska with most lands bordering the Bering Sea and the Gulf of Alaska. These refuge lands and adjacent waters provide important habitat for more than 48 million seabirds and for marine mammals (including seals, sea lions, walrus, sea otters, and whales).

It will be important for anyone having an interest in how the refuge will be managed to participate all through the planning process. *Written comments should be sent to the Alaska Maritime NWR Planning Team, U.S. Fish and Wildlife Service, 1011 E. Tudor Road, Anchorage, AK 99503.*

Barbara Johnson

COMMITTEE ON SEABIRDS AND FISHERIES

Management Complication Off Central California

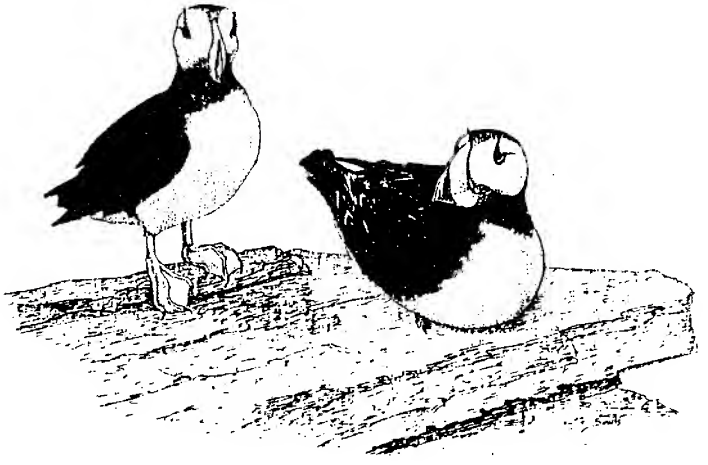
An extensive gill net fishery has developed off the central California coast in recent years. These nets caused the mortality of numerous seabirds and a smaller number of sea otters, species which receive protection by a variety of state and federal legislation. Because gill net fishing requires a permit from the State of California, these impacts have been interpreted as a legal liability of the state. Consequently, fishery regulations have evolved since 1982. On June 20, 1984, the California Legislature enacted a complex set of central California inshore gill net closures addressing local geographic areas of concern. The effects of this management action and possible alternatives were the subjects of a Marine Mammal Commission workshop held in Sausalito, California, on January 3, 1986. The workshop was attended by scientists from government agencies and conservation organizations, and by representatives of fishermen's organizations.

Reviews of the status of the impacted marine mammals and seabirds showed a variety of patterns, most of which were generally consistent with the balance between estimated gill net mortality and population productivity established over the past decade. Both sea otters and common murres (Farallon Islands breeding population) have ceased or reversed their patterns of steadily increasing abundance seen through the late 1970's. Harbor seal abundance continues to increase, but the rate is somewhat lower than it was a few years ago. Although the data have not yet been fully compiled or quantified, it appears that the inshore closure has had the intended effect of reducing mortality on these animals.

A new complication has arisen, in the form of harbor porpoise mortality. Recent incidental mortality estimates are about 300 animals per year. Estimates of population size and structure are still very preliminary, but the incidental mortality rate may be on the order of 10% per year, which exceeds the potential productivity of most delphinids. Moreoever, harbor porpoise reside slightly offshore, and the recent inshore gill net closures may have increased interactions with harbor porpoise, at least in the vicinity of Morro Bay.

Given the wide variety of viewpoints represented by the workshop participants, the atmosphere of the discussions was remarkably constructive. Management is willing and able to take appropriate measures, and fishermen are actively interested in developing better methods and gear. Yet the complexity of the problem precludes simple and equitable solutions. The future course of this dilemma should provide an instructive case study in balancing fisheries and societal goals.

Alec D. MacCall
Committee Chair



FISH AND WILDLIFE SERVICE DECREASES INVOLVEMENT IN SEABIRD STUDIES

At the annual meeting in December 1985, the Executive Council of the PSG was told of a number of instances where the U.S. Fish and Wildlife Service had reduced its involvement in seabird research and seabird-related projects. This reduction appears to be related to a general decreased emphasis on nongame species throughout the agency. Whether this change of priorities will be of short duration and is related to the increased effort that the Service is putting on declining waterfowl populations remains to be seen. The Chair of the PSG is contacting appropriate Fish and Wildlife officials to express the Group's concern and inquire as to the extent and probable duration of the agency's de-emphasis of seabird studies.

Depending on the response to the Chair's inquiries, the PSG may contact west coast senators and congressmen notifying them of the change in the Fish and Wildlife's involvement in seabirds. The next Bulletin will contain information on the agency's response and any further action the PSG Executive Council deems necessary.

In a related matter, the PSG is beginning a survey of federally funded seabird research in the five Pacific states. A number of federal agencies other than the Fish and Wildlife Service conduct seabird research. These agencies include the Bureau of Land Management, Department of Energy, National Oceanic and Atmospheric Administration, Department of Defense, and the National Science Foundation. While seabird studies by all of these agencies have increased in the past decade, the prospect of decreasing federal budgets will certainly decrease their involvement in seabirds. The PSG Executive Council feels that it is important to monitor the federal government's overall involvement in seabird studies, and the Chair of the Executive Council will be contacting all federal agencies conducting seabird research. The agencies will be asked to provide information on the scope and level of funding of all seabird research. The survey will be conducted annually and will serve as a barometer of the government's interest in seabirds and the level of involvement for specific agencies.

January 20, 1986

The Honorable Walter Jones
Chairman, Committee on Merchant
Marine and Fisheries
U.S. House of Representatives
Washington, D.C. 20515

Dear Congressman Jones:

I am writing as the Chair of the Pacific Seabird Group (PSG). I have enclosed a copy of a letter from you to the past Chair, Dr. Daniel W. Anderson. I would like to know what actions the Subcommittee on Fisheries and Wildlife Conservation and the Environment has taken regarding funding for the Fish and Wildlife Conservation Act of 1980. Our membership is very interested in nongame wildlife and I would like to inform them of any progress that has been made regarding funding for nongame research and conservation.

I am concerned that the U.S. Fish and Wildlife Service may be deemphasizing nongame research despite the concern of the public. I have received a number of reports that USFWS will reduce their funding of nongame research. This includes canceling many ongoing research projects and the exclusion of new projects from the budget. I have also heard that USFWS refuges

are receiving little or no funds for nongame species.

Nongame wildlife species and their habitats require continuing study and protection, and they remain a continuing federal responsibility. This includes marine birds and offshore or coastal habitats. On purely economic grounds, these areas of wildlife conservation traditionally seem to end up being low priority items.

The members of the Pacific Seabird Group believe that there should be added funding for nongame research and conservation work. Any reductions in funding for the existing nongame research is contrary to the philosophy expressed in the Fish and Wildlife Conservation Act of 1980 (PL 96-366).

Sincerely,

Lora L. Leschner
Chairperson

February 3, 1986

Ms. Lora L. Leschner
Chairperson, Pacific Seabird Group
Box 321
Bolinas, California 94924

Dear Ms. Leschner:

Thank you for your recent letter regarding the status of H.R. 1406, the Fish and Wildlife Conservation Act of 1980.

As you may be aware, the Committee on Merchant Marine and Fisheries reported H.R. 1406 on May 9, 1985, and the House of Representatives passed the legislation on July 29, 1985. The legislation is now pending action in the Senate. I am enclosing a copy of the bill and the report for your information.

Both the Subcommittee on Fisheries and Wildlife Conservation and the Environment and the full Committee on Merchant Marine and Fisheries considered many possible ways to fund the nongame program. The decision was reached to seek a straight reauthorization because there were no assurances that money raised from alternative funding sources would be earmarked for the nongame program.

I share your concern over the nongame program. Recently I requested the Fish and Wildlife Service to specify exactly what it is spending for this program. I am enclosing a copy of that letter for your information.

With best wishes, I am

Sincerely,

Walter B. Jones, Chairman
Committee on Merchant Marine and Fisheries

[Enclosure]

January 24, 1986

Eugene Hester, Ph.D., Acting Director
U.S. Fish and Wildlife Service
U.S. Department of the Interior
Washington, D.C. 20240

Dear Dr. Hester:

On July 29, 1985, the House of Representatives passed H.R. 1406, legislation to extend the authorization of appropriations for the Fish and Wildlife Conservation Act through FY 1988, unanimously by voice vote. While the Fish and Wildlife Service (FWS) has not sought appropriations under this authority and Congress has not appropriated any money under this authority; nonetheless, there is nongame work being performed by FWS.

I am most interested in ascertaining the specific amounts being spent for the nongame program in these specific items:

1. Full Time Equivalents broken out by responsibilities for game versus nongame projects; and

2. Cost (in thousands of dollars) divided into salaries and operations expenses broken out by game versus nongame projects.

I would like this information for the following Service Units:

1. Alaska Region;

2. Denver Wildlife Research Center (including the National Fish and Wildlife Lab at the National Museum in Washington, D.C.);

3. Northern Prairie Waterfowl Research Center;

4; Office of Migratory Bird Management; and

5. Patuxent Wildlife Research Center.

I thank you in advance for assembling this information for me, preferably by March 15, 1986.

With warm regards, I am

Sincerely,

Walter B. Jones, Chairman

WASHINGTON REPORT

In the waning days of the first session of the 99th Congress, proposed legislation affecting seabirds/shorebirds took a back seat to the passage of budget and farm bills, both of which have provisions of interest to readers of this report. But progress was made on the key bills covered in the last report--Endangered Species, Wetlands Acquisition, Coastal Zone Management, Fish and Wildlife Conservation, Fishery Conservation and Management and Marine Protection, Research and Sanctuaries. In addition, two foreign aid bills and a bill to expand the Virginia National Wildlife Refuge also are of interest.

In the executive and judicial branches of government, major actions included: modifications to the Fish and Wildlife Service's endangered species list; wetland protection; establishment of marine sanctuaries and a Chesapeake Bay critical area; request to use the pesticide, Compound 1080, and ban the pesticide, diazinon; meeting of the Convention of the Conservation of Antarctic Marine Living Resources; failure to ratify the North Pacific Fur Seal convention; and proposed sale of oil leases in Alaska's Bristol Bay. At the local level, New Jersey and Delaware established a migratory-bird protection zone.

LEGISLATIVE ACTIONS

Balanced Budget and Emergency Deficit Control Act of 1985

This Act is informally called Gramm-Rudman-Hollings or GRH. Unless the courts rule that the legislation is unconstitutional, it will take effect in April. To meet the deficit target for FY1987, the proposed budget (which will be submitted to Congress on February 5) is expected to include more than $50 billion in spending cuts split evenly between domestic programs and defense. Congressional staff expect significant budget cuts for the Fish and Wildlife Service and National Marine Fisheries Service. Programs for land acquisition for national parks and wildlife refuges face elimination.

Omnibus Farm Bill

Conserving land is one goal of this massive piece of legislation that revises and extends the policy framework governing programs from crop subsidies to food aid abroad. The key provision affecting migratory birds is the "swampbuster" provision that denies federal farm benefits to farmers who convert wetlands into cropland.

Endangered Species Act

Passed in 1973, this Act provides strict protection for endangered animal and plant species by prohibiting the killing, hunting, collecting, purchase or sale of any species on the endangered species list. The Act also directs federal agencies to ensure that any actions they authorize, fund, or carry out do not jeopardize a listed species or adversely affect its critical habitat. The Act expired on New Year's Day awaiting Senate action. A three-year reauthorization passed the House in July. Neither the House nor the Senate bill makes substantial changes in the Act. Two provisions of interest in the House bill are that candidate species, currently not protected, would become eligible for protection and that funding ceilings for the endangered species program would be increased. Congressional approval is likely in 1986.

Wetlands Acquisition

While the House Merchant Marine and Fisheries Committee approved a wetlands acquisition bill in May, the Senate Environmental Pollution Subcommittee did not hold its first hearing on a similar bill until November. Both bills would establish a new "Wetlands Conservation Fund" of $75 million. Of this money, $50 million would go to state programs for buying and improving wetlands. Other revenue would come from increasing the price of duck stamps and new entrance fees at selected National Wildlife Refuges. In addition, both bills would accelerate completion of the National Wetlands Inventory Program. The fate of this bill is uncertain.

Coastal Zone Management Act

In July, the House voted to reauthorize this Act for five years and freeze funding ceilings at the 1985 levels, except for a 4.5 percent increase to offset inflation. Funding for estuary studies was cut dramatically from $9 million to $2.9 million. First passed in 1972, the Coastal Zone Management Act is the only comprehensive tool that allows federal, state, and local governments to manage cooperatively more than 95,000 miles of beaches, bays, ports, harbors, wetlands, estuaries, islands, and fisheries. Unfortunately, the Senate failed to act on the bill, letting the Act expire in September. Congress probably will not consider a bill in 1986.

Fish and Wildlife Conservation Act of 1980

This Act (also known as the Federal Nongame Act) is intended to provide matching funds to states for nongame species. It appears unlikely that this law will be funded or reauthorized.

Marine Protection, Research and Sanctuaries Act of 1972 - Title I

Congress has been at an impasse over reauthorization of this Act (also known as the Ocean Dumping Act) since 1982. Title I regulates disposal of municipal, industrial, and radioactive wastes at sea. 1986 may be the year that the House and Senate resolve their differences and reauthorize Title I.

Overseas Private Investment Corporation (OPIC)

This reauthorization bill contains provisions that would mandate environmental impact statements for OPIC projects, prohibit projects posing "an unreasonable environmental, health or safety hazard" and require that the host country be notified of applicable U.S. environmental restrictions.

Foreign Assistance Act

Amendments were introduced in the House to protect tropical forests and biological diversity in developing countries by directing the U.S. Agency for International Development to take the specific actions to support small-scale projects rather thandestructive large-scale development projects. The House is expected to act early in 1986.

Virginia National Wildlife Refuge

This bill would expand the existing Eastern Shore of Virginia National Wildlife Refuge and create a federal training center at Cape Charles, Virginia. The expansion is necessary to protect an

area that is important to the migration of birds, including the endangered piping plover, along the Atlantic flyway.

NONLEGISLATIVE ACTIONS

Modifications to the Endangered Species List

To date, the Fish and Wildlife Service lists 856 species, of which 365 species are found in this country. In June, the interior least tern was added to the U.S. list of endangered and threatened species. In December, the piping plover was declared an endangered and threatened species. The East Coast brown pelican has been removed from the list of endangered and threatened species.

Wetland Protection

Members of Ducks Unlimited have given the Migratory Bird Conservation Fund $1.4 million to acquire wetlands for the National Wildlife Refuge System. In a historic 9-0 decision, the U.S. Supreme Court has affirmed a definition of wetlands under the Clean Water Act that had been challenged as too broad, thus strengthening the protection of wetlands throughout the United States.

Chesapeake Bay Critical Area

In September, Maryland, Pennsylvania, Virginia, the District of Columbia, and the federal government signed an agreement to protect the Chesapeake Bay, the nation's largest estuary. Maryland was the first to draft legislation under the agreement. Their plan would create a 1,000-foot buffer around the Maryland shore of the bay and its tributaries. Within this zone, certain restrictions would apply, such as reduction of fertilizers and lumbering. Further development in the zone would be restricted.

Marine Sanctuaries

Fagatale Bay, a 163-acre crater bay off the coast of Tutuilla Island in American Samoa became the seventh National Marine Sanctuary. The National Oceanic and Atmospheric Administration is considering the Norfolk Canyon as a potential National Marine Sanctuary. The Norfolk Canyon is 60 miles off the coast of Virginia. It is an area frequented by seabirds.

Pesticides

Alaska Fish and Wildlife Service is seeking permission from the Environmental Protection Agency (EPA) to use Compound 1080 to protect native birds, particularly the rare Aleutian Canada goose, from introduced predators on Kiska Island in the Aleutian chain. In another action, EPA recently proposed to ban the use of diazinon on golf courses and turf farms because of reports of it killing waterfowl and waders as well as other wildlife.

Convention on the Conservation of Antarctic Marine Living Resources

At the yearly meeting, the 16 member nations addressed the need to protect several commercially exploited fish species, to provent the loss of penguins and other marine life caused by entanglement in lost or discarded commercial fishing gear, and to design an observation system capable of verifying that the protective measures agreed upon are actually enforced.

Ratification of the North Pacific Fur Seal Convention

Animal welfare and environmental groups are divided over the ratification of this treaty. The 1911 convention sets up a system of joint management among the United States, Canada, Japan, and the Soviet Union to control the North Pacific fur seal hunt on the Pribilof Islands off Alaska. The environmental groups support the treaty as a valuable mechanism for managing the fur seal population as well as conducting scientific research on the Bering Sea ecosystem, including black-legged kittiwakes, common murres, red-faced cormorants and auklets. The treaty expired when the Senate failed to take action.

Bristol Bay Oil Leasing

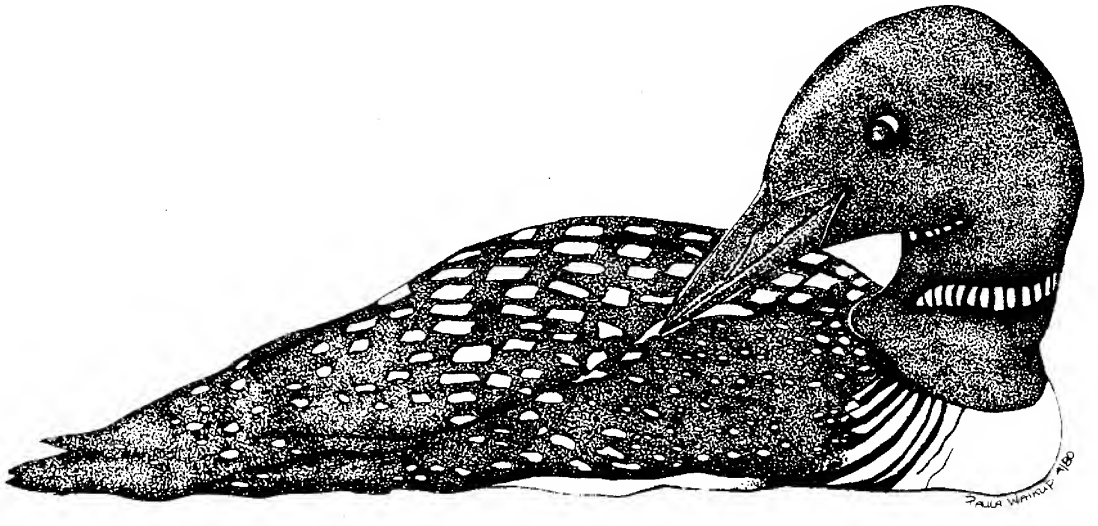
In December, the Department of Interior announced that 5.6 million acres of Alaska's Bristol Bay, one of the world's most productive marine environments, would be auctioned off for oil and gas leasing. The national wildlife refuges surrounding Bristol Bay encompass some of Alaska's most important seabird, shorebird, and waterfowl nesting and staging areas. An alliance of environmentalists, fishermen, Eskimos, and eight coastal states, including Alaska, obtained a preliminary injunction halting the sale. An appeal could be heard in March.

Migratory-bird Protection Zone

The Governors of New Jersey and Delaware signed an agreement to create a migratory-bird protection zone along the Delaware Bay. Money has been set aside for the purchase of land that is critical habitat for shorebirds, especially red knots.

* * * * * * * * * * *

In spite of the inordinate amount of time spent on budget and tax matters, the 99th Congress may be remembered as one that addressed numerous environmental bills from Superfund to Endangered Species. The second session bears watching. As for federal agencies, they will be contemplating a two-edged sword--implementing what Congress enacts within the budget limits required under Gramm-Rudman-Hollings. For anyone involved in environmental protection, 1986 should be an interesting year in the nation's capital.



NEW PUBLICATIONS

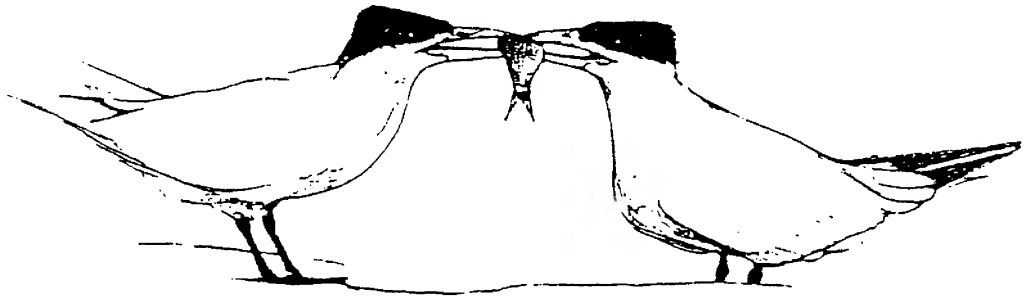
Penguins of the World: a Bibliography. 1985. Williams, A. J., J. Cooper, I. P. Newton, C. M. Phillips, and B. P. Watkins. xi + 255 pp. British Antarctic Survey, Cambridge.

Here is still another contribution that will please penguinophiles, marine ornithologists, and antarctic zoologists alike. Anyone who knows anything about penguins beyond a superficial familiarity also knows that wading through the penguin literature is no easy feat. Without pictures or flowery prose, this book provides the means to make that task surmountable and to track down almost anything you ever wanted to know about penguins. It lists, alphabetically by author, a whopping 1,942 penguin references, including those in the English, French, German, Japanese, Polish, and Russian literature. The task is aided further still by classifications of references according to 17 species and 17 subjects. Subjects range from ecology, morphology, and physiology to diseases, aviculture, and conservation. Both this volume and its companion (*Distribution and abundance of Antarctic and sub-Antarctic penguins: a synthesis of current knowledge. 1983.* Wilson, G. J. BIOMASS Sci. Ser., No. 4) were instigated by the BIOMASS Working Party on Bird Ecology (WPBE), in an effort to better coordinate avian research in the Antarctic.

This volume confirms, if there was ever any doubt, that penguins are among the best known wild vertebrates on earth, and that pygoscelid penguins are certainly the best known of all antarctic creatures. Penguins lend themselves to investigation through several aspects of their behavior and natural history. This accounts for the tremendous wealth of information available about their lives, and places them in a primary position to allow us insight into changes in their environment. The latter aspect of penguindom fits well with increasingly important efforts to monitor human impacts on the antarctic marine ecosystem, something which the WPBE had in mind when efforts to produce this volume began. One drawback to all we know and are continuing to learn about penguins, of course, is that this volume will beg to be updated in the not-too-distant future.—David G. Ainley, Point Reyes Bird Observatory

The Atlantic Alcidae. 1985. David N. Nettleship and Tim R. Birkhead (editors). XX + 574 pp., Academic Press, New York

This book (which covers the evolution, distribution, and biology of the auks inhabiting the Atlantic Ocean and adjacent water areas) was published in late 1985. The volume will be reviewed in a future PSG Bulletin.



BULLETIN BOARD

International Editorial Board for Colonial Waterbirds

As noted at the San Francisco meeting, Colonial Waterbirds Now has an international board of editors. It will also now publish unsolicited commentary on matters of interest to biologists studying colonial waterbirds and unsolicited reviews of pertinent books. It is a fully refereed journal emphasizing all aspects of the biology, conservation, and methods of study of aquatic birds that nest in aggregations, including seabirds. The journal is noticed in all prominent bibliographic services, including Current Contents and BIOSIS. Members of PSG are cordially invited to submit papers, notes, commentary, or book reviews for consideration to the general editor (Dept. of Biological Sciences, East Texas State Univ., Commerce, TX 75428 USA) or to one of the regional editors. The editor for the Pacific is Dan Anderson (Dept. Wildlife and Fisheries, Univ. of California, Davis CA 95616).

Seabird Specialist Group of ICBP

The Seabird Specialist Group of the International Council for Bird Preservation invites ornithologists interested in seabird biology and conservation to communicate with us. Our recent book 'Status and Conservation of the World's Seabirds" (I.C.B.P. Technical Publication No. 2, 1984, 778 pp., £24.95 plus £2.00 postage, from ICBP, 219c Huntingdon Rd., Cambridge CB3 0DL, England) summarizes our knowledge to 1982. We desire to keep current on status and prospects of the world's seabirds in order to take action on behalf of birds where we can, and to encourage communication between seabird people. If you are interested in participating or providing information, contact the current chairman, Ralph W. Schreiber, Natural History Museum, 900 Exposition Blvd., Los Angeles, CA 90007, USA.

Trumpeter Swan Society

The Trumpeter Swan Society will hold its 10th Biennial Conference in Grande Prairie, Alberta, Canada, 3-7 September 1986. It will be sponsored by the Alberta Fish and Wildlife Division and the Canadian Wildlife Service. For information concerning facilities and the presentation of papers, contact Rick McKelvey, Canadian Wildlife Service, P. O. Box 340, Delta, B.C., Canada V4K 3Y3.

Merger of the Gull Study Group with the Seabird Group

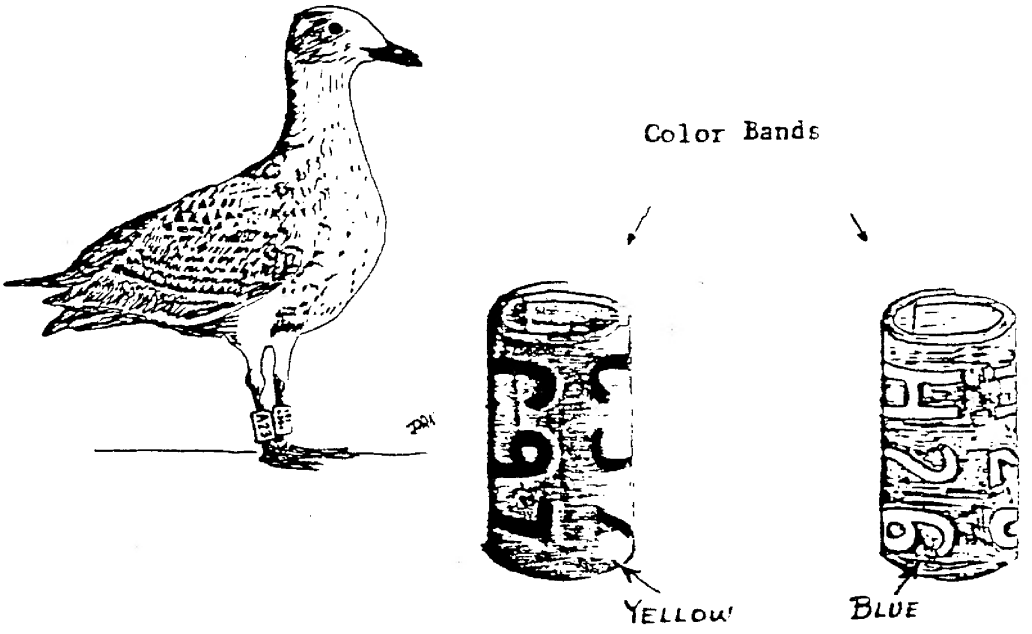
The Gull Study Group has felt, for some time, that it has been wasteful to split the support and activities between two different groups. They have recently merged with the Seabird Group.

The Scandinavian Seabird Group

The Scandinavian Seabird Group was formed in 1978 by ornithologists in Denmark and Sweden. It has been joined by ornithologists in Norway in 1984. General information about the group is available from Erik Vikkelso Rasmussen, Hjortsvej 18, OK 45000 Nykobing Sjaelland, Denmark.

The group will produce a new journal, *Pelagicus*, which will concentrate on seabird migration. Articles on other subjects are also welcome. Manuscripts should be sent to: Mats Peterz, editor *Pelagicus*, Snickargatan 18, S-753 37, Uppsala, Sweden. The journal will be available from Dansk Ornithologisk Foraning, OOF - Salg, Vesterbrogade 140, OK-1620 Copenhagen V, Denmark.

WANTED



INFORMATION ON BANDED GULLS

Young Herring Gulls and Herring x Glaucous-winged Gull hybrids were banded at two localities in southcentral Alaska, 1982-85. In 1983-85 the birds were marked with metal bands on the left leg and large plastic color bands on the right leg. In 1982 the color bands were a smaller variety, colored red or black instead of blue or yellow. Anyone sighting one of these birds is urged to contact David Nysewander or Art Sowls, U.S. Fish and Wildlife Service, 1011 E. Tudor Rd., Anchorage, AK 99503 (phone: (907) 786-3451 or 786-3458). Minimum information requested includes the color of plastic leg band, alphanumeric symbols (letter plus 2 numbers) if it is possible to read, the date, and the location. Notes on habitat, behavior, and number/age/species of other birds with which it was associated would be useful.

NEW MEMBERS

John Anderson
Department of Zoology
University of Rhode Island
Kingston, RI 02881
*Breeding ecology of White Pelicans, evolution of cooperative behavior

Josefina Arriola
Institute de Biologia - Ornitologia UNAM
Apdo Postal 70-153
04510 Mexico D.F., Mexico

Dora Boersma
302 E - 1720 Baseline Road
Nepean, Ontario K2C 089, Canada

Donna Brewer
1340 West 6th Street
Los Angeles, CA 90017
*Ecology of seabirds

Anne L. Brown
c/o SOHIO
P. O. Box 6-612
Anchorage, AK 99502
*Impact studies related to migratory birds in Alaska

Pamela E. Byrnes
830 West I Street
Benicia, CA 94510

Ron Carter
Department of Biology
Walla Walla College
College Place, WA 99324
*Parent-infant behavior: kin recognition in gulls

Dan Costa
Long Marine Laboratory
University of California
Santa Cruz, CA 95064

William E. Davis, Jr.
127 East Street
Foxboro, MA 01035
*Vocalization and foraging ecology of herons

Ron Duke
P. O. Box E
Alviso, CA 95002
*Estuarine birds and seasonal wetland use

Fulvio Eccardi
Apdo Postal 20-617
delea. A. Obregon
01000 Mexico D.F., Mexico
*Photography of Baja California seabirds

William T. Everett
Department of Birds and Mammals
San Diego Natural History Museum
P. O. Box 1390
San Diego, CA 92112

Brian Fadely
273 Applied Science
University of California
Santa Cruz, CA 95064

Anthony J. Gaston
30 Dufferin Road
Ottawa K1M 2AB, Canada

Heinz Hafner
Biol. Station. TOUR DU VALAT
LE SAM B11C
F-13200 Arles, France
*Breeding biology of ardeids

Barbara Hahs
Monterey Bay Aquarium
886 Cannery Row
Montgomery, CA 93940
*Ecology of seabirds and otters

Alan Harper
Department of Zoology
University of California
Berkeley, CA 94720
*Adult-offspring recognition in seabirds

Jeremy J. Hatch
Biology Department
University of Massachusetts
Boston, MA 02125

Emilio Hernandez
Instituto de Biologia - Ornitologia UNAM
Apdo Postal 70 - 153
04510 Mexico D.F., Mexico

Kenneth Kertell
211 La Vida Way
Davis, CA 95616

James A. Kushlan
Department of Biology
East Texas State University
Commerce, TX 75428
*Editor, Colonial Waterbirds

Moira Lemon
4684 West 9th Avenue
Vancouver, B.C. V6R 2E4, Canada
*CWS. Burrow nest surveys along the B.C. coast

Laurie MacIvor
Department of Forestry and Wildlife Management
Holdsworth Hall, University of Massachusetts
Amherst, MA 01003
*Ecology of Piping Plovers and Bonaparte's Gulls

E. H. Miller
Collections Management Program
B.C. Provincial Museum
Victoria, B.C. V8V 1X4, Canada

Nancy Naslund
115 Moore Creek
Santa Cruz, CA 95060
*Ecology of tropical seabirds, human impact

Michael Newcomer
Moss Landing Marine Laboratories
P. O. Box 4150
Moss Landing, CA 95039
*Seabird distributions, ecology and behavior

Robert L. Norton
P. O. Box 243, Cruz Baym, St. John
U.S. Virgin Islands 00830
*Ecology of terns, environmental influences on population changes

Jill Parker
7361 Huntsmen Drive
Anchorage, AK 99518
*Impact studies related to seabirds in Alaska; ardeidae

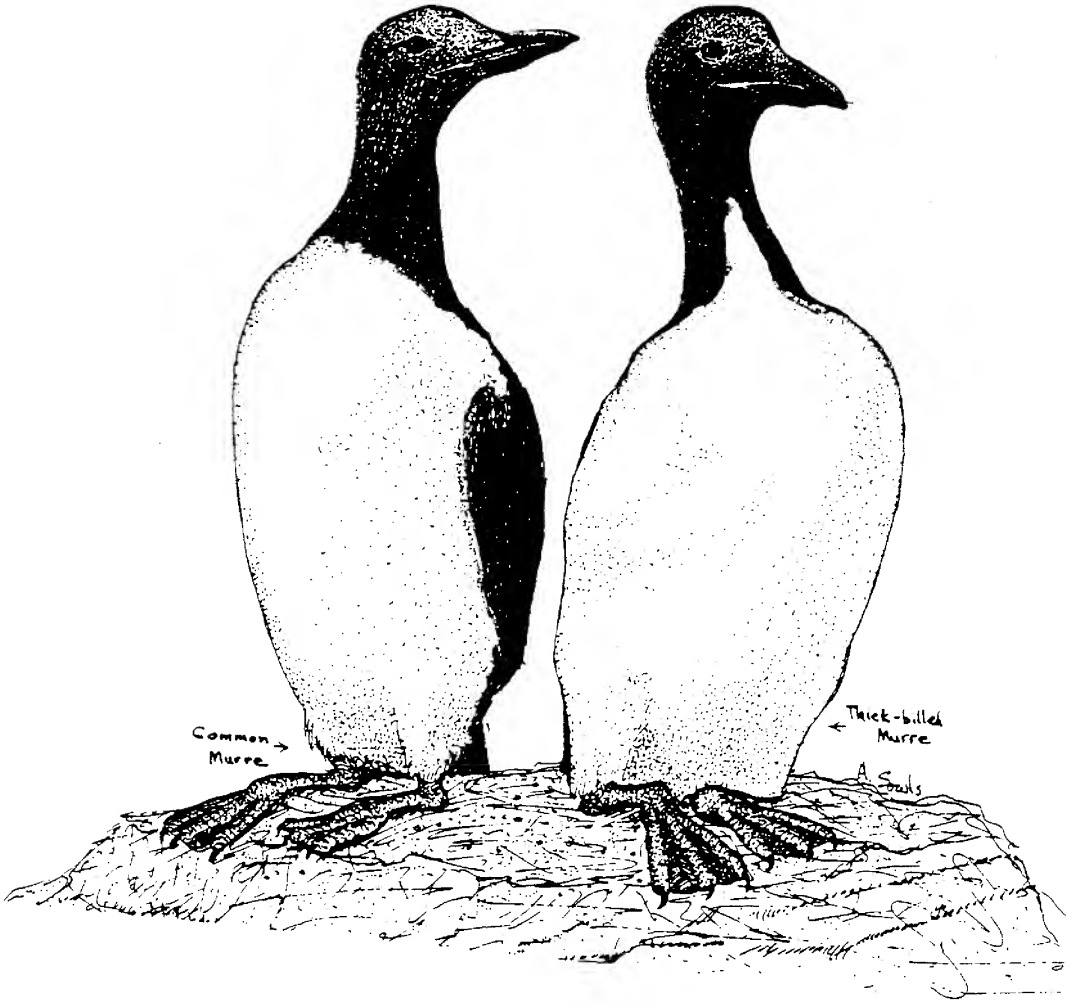
Ken Partridge
165 Stanborough Road
Elburton-Plymouth-Devon PL9 8NY
United Kingdom

Lisa Posternak
Wildlife Department
Humboldt State University
Arcata, CA 95521
*Wetland ecology, heron/egret behavior

Iola Price
563 Fairview Avenue
Ottawa, Ontario K1M 0X4, Canada
*Treasurer, Colonial Waterbird Group

Ginny Rosenbera
2126 SW Arnold
Portland, OR 97219
*Ecology of Bonaparte's Gulls and Double-crested Cormorants

Mark Silberstein
P. O. Box 267
Moss Landing, CA 95039
*Coastal wetlands ecology


Common Murre
Thick-billed Murre
Seals

PACIFIC SEABIRD GROUP EXECUTIVE COUNCIL 1986

Officers

Chair	Lora L. Leschner, Washington Dept. Game, 16018 Mill Creek Blvd., Mill Creek, WA 98012
Chair-Elect	Kenneth T. Briggs, Coastal Marine Laboratory, Univ. California, Santa Cruz, CA 95064
Secretary	Tony DeGange, U.S. Fish and Wildlife Service, 1011 E. Tudor Rd., Anchorage, AK 99503
Treasurer	Douglas Siegel-Causey, Museum of Natural History (Birds), Univ. Kansas, Lawrence, KS 66045
Editor	Malcolm C. Coulter, Savannah River Ecology Laboratory, P.O. Drawer E, Aiken, SC 29802

Past Chairs

Daniel W. Anderson, Dept. Wildlife and Fisheries Biology, Univ. California, Davis, CA 95616

Judith L. Hand, 1647 Michael Lane, Pacific Palisades, CA 90272

Craig S. Harrison, 46-024 Puulena St., #614, Kaneohe, HI 96744

Regional Representatives

Alaska	Ed Murphy, Life Sciences, Irving Bldg., Univ. Alaska, Fairbanks, AK 99708
British Columbia	Gary Kaiser, P.O. Box 125, Delta, BC V4K 3N6, Canada
Central California	Michael Fry, Dept. Avian Science, Univ. California, Davis, CA 95616
Great Lakes	Hans Blokpoel, 1115 Cromwell Cr., Ottawa, Ontario K1V 6K3, Canada
Hawaii	Stewart I. Fefer, U.S. Fish and Wildlife Service, Box 50167, Honolulu, HI 96850
Inland	Paul C. James, Dept. Veterinary Anatomy, Univ. Saskatchewan, Saskatoon, Sask. S7N 0W0, Canada
Mexico/Latin America	Enriqueta Velarde, Inst. de Biología, Depto. de Zoología, Apartado Postal 70-153, 0-4510 Mexico, D.F., Mexico
Northeast	Mark L. Tasker, Nature Conservancy Council, 17 Rubislaw Ter., Aberdeen AB1 1XE, United Kingdom
Northern California	Thomas E. Harvey, 543 Crofton Ave., Oakland, CA 94610
Oregon	Palmer C. Sekora, Route 2, Box 208, Corvallis, OR 97333
Southeast	Ron Naveen, 2378 Route 97, Cooksville, MD 21723
Southern California	Zoe Eppley, Dept. Ecology and Evolutionary Biology, Univ. California, Irvine, CA 92717
Washington	Steve Speich, 2926 S. Quince St., Olympia, WA 98501

Pacific Seabird Group
Savannah River Ecology Laboratory
P.O. Drawer E
Aiken, South Carolina 29801

Pushcart 1880s
12.5
Bulk Rate
USA

George J. Divoky
Strat. Assess. Br. - Ocean Assess.
NOAA - Natl Ocean Service - N/OMA3
Rockville MD
20852

Address Correction Requested

UPD 5895/3-86